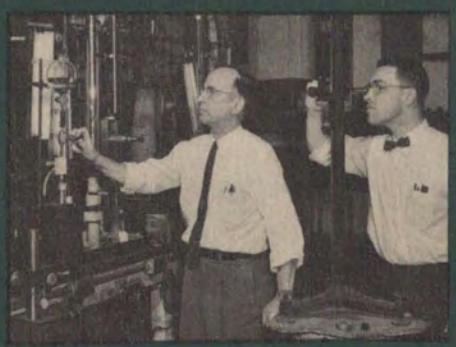
The Ohio State University

Our standard is excellence

Our mission is distinction in higher learning



1958-59

The President's Report

BULLETIN OF THE OHIO STATE UNIVERSITY

The Ohio State University

Our standard is excellence

Our mission is distinction in higher learning

1958-59

The 89th Annual Report by the President
to the Board of Trustees, the Governor
and the Citizens of Ohio

THE OHIO STATE UNIVERSITY

COLUMBUS 10

OFFICE OF THE PRESIDENT

September 7, 1959

Judge Robert N. Gorman
Chairman, Board of Trustees
The Ohio State University
Columbus 10, Ohio

Dear Judge Gorman:

I have the honor to present through you to the Board of Trustees, the Governor, and the Citizens of Ohio the 89th Annual Report of The Ohio State University.

The emphasis in this Report is on the extraordinary role and contributions of the University to the State in certain areas of special, advanced graduate, and professional education, and on research.

Respectfully yours,

Novice G. Fawcett

Novice G. Fawcett
President

NGF:jb

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THE DEATH OF Charles F. Kettering on November 25, 1958 ended a remarkably long and fruitful association with The Ohio State University. The Board's Memorial Resolution states, in part:

"For exactly sixty years the life lines of Charles F. Kettering and The Ohio State University were entwined closely. He served continuously as a Trustee or as Treasurer for forty-one years. His nearly twenty-five years as a Trustee, first from 1917 to 1925, and then from 1941 until his death, completed the longest term of service given by a member of the Board."

"The imprint he left on The Ohio State University is everlasting. Apart from his notable service as a Trustee and as Treasurer, he was an early benefactor of the Univerity Hospital and was one of the originators of the University's Research Foundation. As the 1958 President's Report has emphasized, The University's product is people. Certainly, in its eighty-five years, it has produced no more illustrious son than Charles F. Kettering."

Message From The President

A GREAT STATE university will flourish in the fulfillment of its mission when the ongoing aspects of its exciting ventures are interpreted to and understood by the people whose lives are dedicated to the institution and by the people who support it.

This Report of The Ohio State University's 89th year represents a sincere effort to interpret the University's constant striving for distinction in higher learning, which is its mission. Its standard of performance is excellence in teaching and research. The focus of the Report is on graduate and professional education and on the growing significance of research as a means of broadening and deepening man's knowledge of himself and of the increasingly complex world society in which he lives.

Advanced education and research constitute major responsibilities of higher learning which this University must foster vigorously and wisely in the years ahead. For these are salient features, costly to build and maintain, which lead to wisdom and strength.

Undergirding the extremely productive, often unique, efforts of the University's scholars in the humanities, the social sciences, and the sciences is a strong foundation of undergraduate collegiate programs. From the undergraduate colleges of this University, and from other public and private colleges throughout the state and nation, come a continuous stream of talented young men and women whose intellects at this critical moment in world history are our finest resource and our best hope for the survival of free men and free nations.

Under the guidance of resourceful scholars, new intellectual vistas are opened to competent young professional college and Graduate School students. Through their researches in the various disciplines, new and useful knowledge is uncovered and assimilated, and proficiency for continuing growth is achieved. Ultimately, as practicing professionals, as scholars, and as citizens, their perceptive intellects become engaged in the continuous development of the economic, social, scientific, political, cultural and spiritual lives of all our people.

The Ohio State University, which is dedicated to the improvement of people, makes its most significant contribution to the state's and nation's citizenry and to the world of knowledge in the so-called "expensive" areas of education, that is, on the professional and Graduate School levels.

The perusal of these pages should reveal that the increasingly vigorous support of advanced education is an investment in the security of our nation, a never-ending venture of free men in a free society, and the ever-present hope for all mankind.

Novice G. Fawcett

President

Foreword

THE OHIO STATE UNIVERSITY is a complex institution of higher learning which, born of the Land Grant College Act, has grown to become the leading university center for advanced graduate and professional education and research in Ohio.

The course which led this institution to its high level of educational, and resulting research, attainments was set in 1871, nine years after President Lincoln signed the Morrill Act, known as the Land Grant College Act.

It was in this year that the trustees at their first annual meeting debated and determined the character of the newly chartered state institution. The University today stands as evidence of the success of those advocates of the "broad gauge" idea over those of lesser vision.

The seed was then planted for the tree from which have grown and developed the many branches of learning and research, that now comprise the University. That growth has been nurtured by eight presidents and many other dedicated individuals and directed toward meeting the needs of the people of this state.

The University of today is composed of a strong, central core of undergraduate colleges and schools embracing agriculture, the arts and sciences, commerce, education, engineering, music, nursing, fine arts, architecture, home economics, journalism and social administration.

Beyond the undergraduate level of the University are the Graduate School and those colleges and schools offering degrees in the professions after additional years of preparation. Such advanced fields include dentistry, law, medicine, pharmacy, optometry and veterinary medicine.

The University's unique contributions among the state-supported institutions, and, in many instances among all colleges and universities in Ohio, lies in certain special, advanced graduate and professional fields, as well as in research. These provide the theme and subject matter for this year's Annual Report.

The University, as will be pointed out in more detail in various sections of the Report, offers the only degree educating in agriculture, optometry and veterinary medicine in the state.

Furthermore, it is the only tax-supported institution educating physicians, nurses, dentists, dental hygienists, lawyers, pharmacists, architects and landscape architects.

It provides the major center for graduate education in the state, offering advanced work leading to the Doctor of Philosophy degree in 60 different departments of learning, and the Master's degree in 74.

Programs on the Ph.D. level include the branches of engineering, physics and astronomy, the humanities and other social, physical and biological sciences, all listed by departments of instruction on Page 7.

The impact of the University on every community of this state, particularly through its professional graduates, is illustrated throughout that section of the Report devoted to the professional colleges. In many counties the majority of doctors, lawyers, optometrists, dentists, veterinarians and others are products of this University.

Research on this campus is pursued by faculty and students on as many frontiers of knowledge as are represented by the 84 different departments of instruction. Some of these projects and the distinguished scientists directing them are included in the Research Section of the Report.

The Report is in itself a tribute to the many persons — legislators, administrators, trustees, faculty, staff, students and alumni — who have had a direct hand in making possible the University's unique role in Ohio. For those who helped with suggestions and material, appreciation is here expressed.

The Ohio State University

Center for Graduate Education In Ohio

AS THE MAJOR center for graduate education in Ohio, the University is in a unique position to offer advanced educational and research programs in almost every area of knowledge not only to the citizens of this State, but to the nation and the world.

From its laboratories and classrooms come the men and women with graduate degrees in the humanities and the social, biological and physical sciences who will fill positions in education, in business, industry and other areas of our society demanding unusual skills and knowledge.

The University's unique position as a graduate center arises from the number of high quality fields of specialization which it offers. As is indicated in the lists starting on this page there are 74 different departments of instruction in which a student may obtain the Master's degree and 60 in which he may study for the Doctor of Philosophy degree.

Graduate instruction had its beginnings at the University in the 1890's, some 20 years after it had opened. In 1902, as facilities were increased, and in recognition of the desire on the part of other colleges of the state, a Graduate School was organized in what was then known as the College of Arts, Philosophy, and Science.

Even in those early years the University led in its graduate offerings. Professor George Wells Knight, chairman of the administrative board of the developing school, said in his 1906 report:

"In all branches of science, dependent as they must be upon ample laboratory equipment, apparatus, and appliances, the University is equaled by none other in the State and by few in the West. For work in theoretical, experimental, and applied science, there is good provision for many varied lines of investigation. In literature, history, economics, sociology, and political science, dependent largely upon library resources and material for advanced work, the equipment of the University, to which may be added the State Library at the State House, is better than that afforded at any other institution in Ohio, but must be largely increased in the near future, if the Graduate School is to win and maintain its proper place."

The Legislature in those early days had not only given recognition to graduate work through allocations for graduate assistantships, but, according to the early historians, had "seemingly required the University to maintain and develop its graduate instruction." The stage was thus set for action, which came in 1911, for the establishment of a University-wide Graduate School, with the late Dr. William McPherson as its first dean.

OHIO STATE RECOGNIZED AS THE GRADUATE CENTER

In 1913 the Legislature further recognized the new School with an appropriation for fellowships and scholarships, and the following year the Board

GRADUATE INSTRUCTION IS OFFERED IN THESE AREAS

HUMANITIES
- Classical Languages
- English
- Fine and Applied Arts
- German
- History
- Journalism*
- Music
- Philosophy
- Romance Languages
- Speech

SOCIAL SCIENCES
- Accounting
- Agricultural Economics and Rural Sociology
- Agricultural Education
- Business Organization
- Economics
- Education
- Geography
- Political Science
- Psychology
- Social Administration
- Sociology and Anthropology

BIOLOGICAL SCIENCES
- Agronomy
- Anatomy
- Animal Science
- Bacteriology

*Denotes Master's Degree only

of Trustees was able to set aside annually $10,000 to establish a system of fellowships and scholarships for graduate students.

The other state colleges and universities lent their support to the idea that there should be one central Graduate School in the state and in 1915 representatives of these schools adopted a resolution which stated in part: "That we unanimously concur in the opinion that the interests of higher education in Ohio require one well equipped and well organized Post-graduate School at the Ohio State University conferring all post-graduate degrees."

This did not mean that the other state schools, as well as other Ohio colleges and universities, did not offer graduate training. Work toward the Master's degree in limited fields today may be taken at many of the colleges and universities, including the state universities. The Ph.D. is offered at Western Reserve, Case, Cincinnati and Akron in some fields. Ohio University, among the state institutions, has introduced Ph.D. programs in chemistry, speech, and education.

NEARLY 24,000 GRADUATE DEGREES CONFERRED

The growth of the Graduate School has been continuous. By 1912 it had established connections with the Ohio Agricultural Experiment Station at Wooster, whereby University students might engage in research there as part of their requirements toward graduate degrees.

This has been a particularly fruitful arrangement. Annually nearly 100 graduate students conduct research under supervision of station scientists. About one-sixth of all Master's degrees and nearly a fourth of all doctorate degrees conferred by the University are in the departments within the College of Agriculture and Home Economics. Many of these

graduates do their research work at the Experiment Station.

In 1917, the Graduate School, in connection with the College of Medicine, added graduate courses in anatomy, pathology, physiology, and physiological chemistry. In the ensuing years other quality graduate programs were added as facilities and staff became available.

As recently as 1958 the University approved the first and only graduate degree in Ohio in city planning in the School of Architecture and Landscape Architecture. This year the School of Music has been authorized to give the Ph.D. degree.

Today, as mentioned previously, the Graduate School offerings have grown to areas of specialization in 74 different departments of instruction — an unequaled number among the colleges and universities of the state.

In the years since the 1890's the University has conferred 23,825 graduate degrees, with 4,812 of

GRADUATE INSTRUCTION IS OFFERED IN THESE AREAS

Botany and Plant Pathology
Dairy Science
Dairy Technology
Dentistry*
Home Economics
Horticulture and Forestry
Medicine
Nursing*
Obstetrics and Gynecology*
Ophthalmology*
Optometry (Physiological Optics)
Pathology
Pediatrics*
Pharmacy
Physical Education
Physiological Chemistry
Physiology
Poultry Science
Preventive Medicine*
Psychiatry*
Radiology*
Surgery*
Veterinary Anatomy
Veterinary Medicine
Veterinary Parasitology
Veterinary Pathology
Veterinary Physiology and Pharmacology

"A graduate school is an educational institution devoted to the acquiring, preserving, and dissemination of advanced knowledge through research, its evaluation, and application."

these being the doctoral degree. Chemistry, education, psychology, zoology and entomology, and physics and astronomy have produced the greatest number of graduates with doctoral degrees, followed by chemical engineering, botany and plant pathology, agronomy, English, business organization and history in that order.

The Graduate School ranks eighth among the Graduate Schools of the nation in number of doctoral degrees conferred. During the current year its enrollment reached a peak of 3,437, with most of these men and women coming from Ohio, many of whom had completed their undergraduate work at other Ohio colleges and universities.

This service rendered other Ohio institutions of learning by the Graduate School of the University in providing a center for graduate education is re-

(Continued on page 11)

GRADUATE DEGREES CONFERRED BY THE OHIO STATE UNIVERSITY

The following graduate degrees are conferred by the Ohio State University: Master of Arts and Master of Science (both covering many areas of specialization); Master of Education, Master of Business Administration, Master of City Planning, Master of Social Work, Master of Science and Public Administration, Master of Medical Science and Doctor of Philosophy. (Note: The Doctor of Philosophy degree is offered in limited fields at only five other Ohio schools at this time, Western Reserve University, University of Cincinnati, Case Institute of Technology, the University of Akron, and Ohio University.)

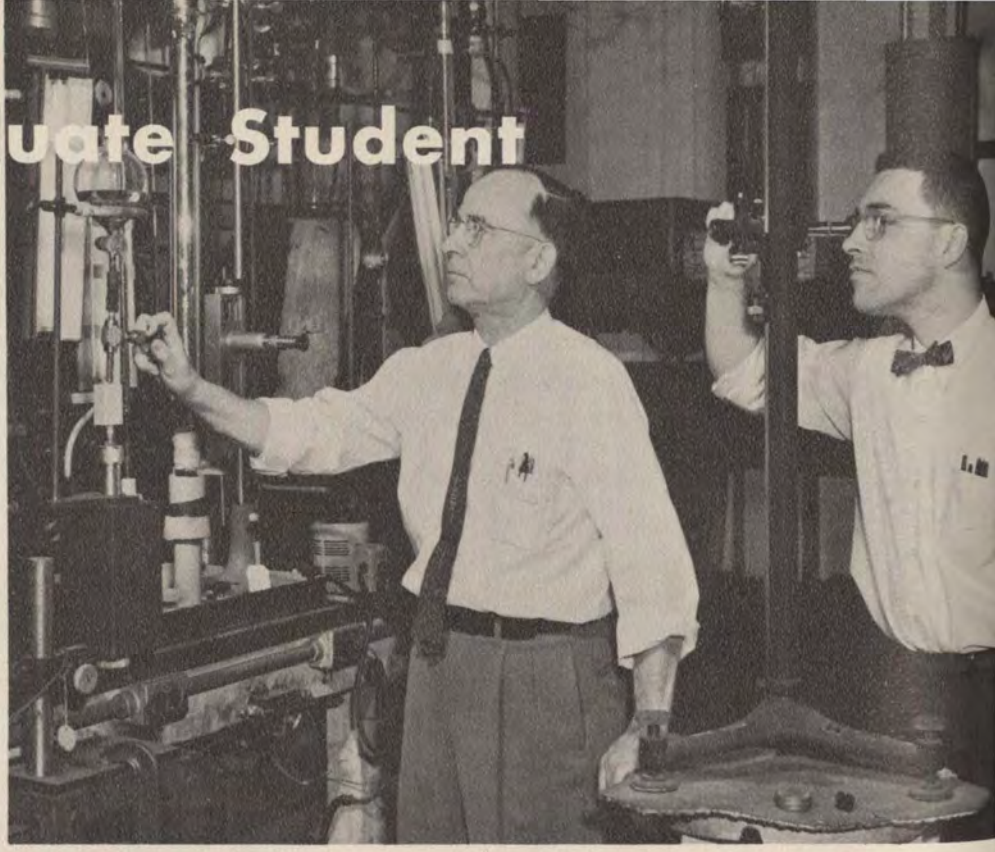
Veterinary Preventive Medicine
Veterinary Surgery
Zoology and Entomology

PHYSICAL SCIENCES

Aeronautical Engineering
Agricultural Engineering*
Agricultural Biochemistry
Architecture and Landscape Architecture (City Planning)*
Ceramic Engineering
Chemical Engineering
Chemistry
Civil Engineering
Electrical Engineering
Engineering Mechanics
Geology (including Geodesy, Photogrammetry and Cartography)
Industrial Engineering
Mathematics
Mechanical Engineering
Metallurgical Engineering
Mineralogy
Mining and Petroleum Eng.*
Physics and Astronomy
Welding Engineering*

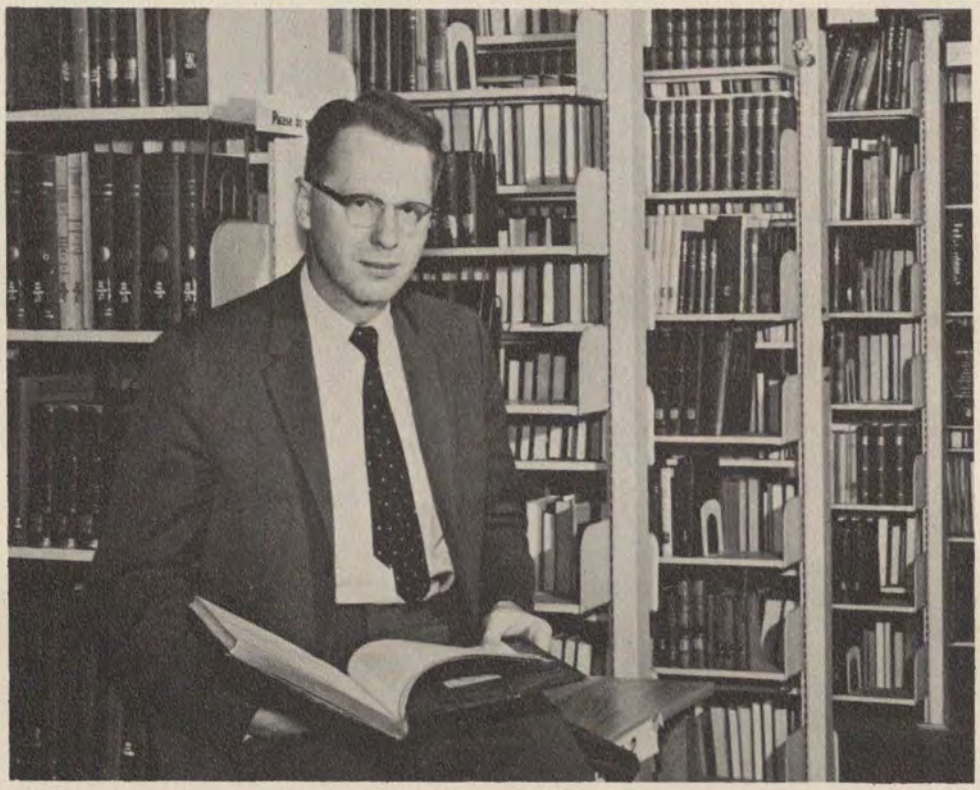
*Denotes Master's Degree only

The Graduate Student



GLENN F. LEVERETT came to Ohio State from the University of Toledo where he had received his Bachelor of Science degree in Chemical Engineering (Cum Laude). Now working toward his Ph. D. in Chemical Engineering, Leverett was awarded an Esso Research and Engineering Fellowship. His faculty advisor, Professor Webster B. Kay, assists him here in checking some equipment.

Some of the University's recipients of fellowships and assistantships are pictured in the next few pages in laboratories, classrooms and libraries as illustrative of the work and environment of many of the graduate students on the campus.



SIEGFRIED WENZEL enrolled in the Graduate School at Ohio State after completing work for his M.A. degree at Ohio University. Wenzel, who holds a University Fellowship, is a candidate for his Ph.D. in Medieval English Literature. He received his undergraduate degree from the University of Parana (Brazil).

"The price of education is great — but not nearly so great as the price of ignorance."

Center for Graduate Education — Continued

flected in the list appearing on Page 13 of this Report. Students from 45 of these institutions were enrolled during the year under review as graduate students on this campus.

Maintenance of a Graduate School capable of fulfilling its responsibility to society for high-level education requires many assets, many of them expensive. Essential is a highly competent faculty whose members are authorities in their particular fields of specialization. In many cases a prospective graduate student will select Ohio State because of an outstanding scholar or group of experts.

The Ohio State University is particularly fortunate in this regard with more than 800 scholars, many of international repute, serving on the graduate faculty, their selection based upon their scholarly contributions to their special fields. Some of them are pictured in the Section of this Report devoted to areas of distinction in Research.

Attracting and holding such a faculty requires adequate funds for salaries and the means for providing other opportunities for continued growth and development of the scholar. The latter include such items as travel funds so that the faculty member may keep in touch with his associates and their professional activities through meetings of learned societies, time for research, freedom from administrative assignments, adequate laboratory and research facilities.

Maintenance of a large and comprehensive library system is an essential attribute of a great university. The University Libraries, with more than 1,300,000 volumes available, represent the largest research collection in the state. The facilities of the University Press, started relatively recently, provide another attraction for the scholar, offering an outlet for the publication of research works and other contributions to man's knowledge and enlightenment.

Administrators of the Graduate School have devoted particular attention to encouraging more young men and women of high scholastic abilities

ROBERT E. MALCOLM (left) of Seven Mile, Ohio, strolling across campus here with Professor James R. McCoy, has achieved just about every undergraduate scholastic honor. A graduate of Miami University (Cum Laude) he made Phi Beta Kappa, scholastic honorary, and Beta Gamma Sigma, commerce scholastic honorary. Since coming to Ohio State he has received his Master of Business Administration degree and is currently working toward his Ph. D. in Accounting after which he hopes to go into the automatic data processing field. Holder of a General Electric Fellowship for this year, he has been selected for a Ford Foundation Fellowship for next.

into electing to go forward into advanced studies. Recognizing that finances are often a controlling factor in the student's decision, the University is constantly exploring means for increasing the number and amounts of stipends available for such students.

It is estimated that it costs an unmarried graduate student, who is a resident of Ohio, about $1,330 for a year of study. University fees take $270 of this amount, laboratory fees, books and supplies $235, and board and room $825. A student from out of the state must pay an additional non-resident fee, increasing his yearly outlay to about $1,975. Neither total includes any allowance for travel or miscellaneous living expenses.

Many students are married by the time they are ready for graduate work. Thus they have to resolve a financial problem, often complicated by debts accumulated in obtaining their undergraduate education. They are tempted, particularly in the sciences and engineering, by attractive offers from employers for immediate employment.

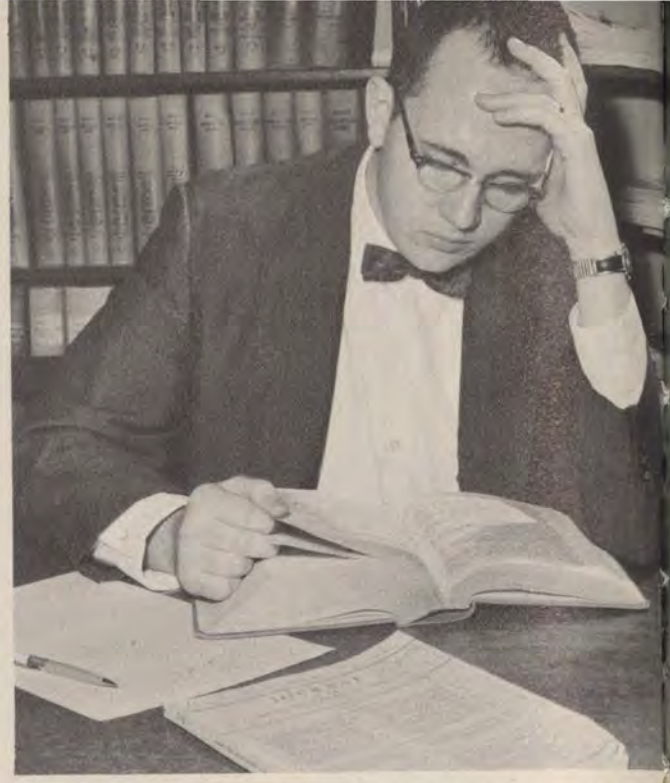
In an effort to meet this challenge and make it possible for the gifted student to continue his studies, many governmental and industrial agencies and private foundations have made available graduate fellowships which provide substantial amounts toward the cost of continued education. Some of the holders of these grants are pictured in this Section.

The University, at the same time, provides a limited number (26) of additional fellowships, and some 300 departmental assistantships, enabling the student to earn some of his expenses through teaching. These sources of income from the University average about $2,000 per student for a nine-month school term. This year 800 students applied for the 26 fellowships.

Further increases in the number and amounts of these stipends are needed if the University is to continue to expand its position in graduate education and encourage more promising young scholars to continue toward high-level degrees.

Confronted with a population growth that may double college enrollments within 10 years and add to the technological and social problems of society on a national and international scope, the Graduate

(Continued on page 14)



BRUCE EDWARD NORCROSS pours over some of the research reports in the Chemistry Library. A National Science Foundation Fellow, Norcross is a candidate for his Doctor of Philosophy degree in Chemistry. He holds his Bachelor's and Master's degrees from the University of Vermont.

WILLIAM GREEN FELLOWSHIPS were held by Milton Farber, Jr., and Martha Lee Saenger, both Ph. D. candidates. Income from a fund established at the University in memory of the late labor leader is used for the Fellowships. Farber, a Miami University graduate, received his degree in June in History; Miss Saenger, an Ohio State graduate, is a political science major. Professor Alma Herbst (right) is chairman of the William Green Fellowship Committee.

OHIO INSTITUTIONS FROM WHICH STUDENTS CURRENTLY ENROLLED IN OHIO STATE'S GRADUATE SCHOOL HAVE RECEIVED PREVIOUS DEGREES

Antioch College
Ashland College
Baldwin-Wallace
Bluffton
Bowling Green
Capital University
Case Institute of Technology
Central State College
College of Steubenville
College of Wooster
Defiance College
Denison University
Fenn College
Findlay College
Heidelberg College
Hiram College
John Carroll University
Josephinum College
Kent State
Kenyon College
Marietta College
Miami University
Mt. St. Joseph-on-the-Ohio
Mt. Union College
Muskingum College
Notre Dame College
Oberlin College
Ohio Northern University
Ohio State University
Ohio University
Ohio Wesleyan University
Otterbein College
Our Lady of
Cincinnati College
St. Mary of
the Springs College
University of Akron
University of Cincinnati
University of Dayton
University of Toledo
Western College for Women
Western Reserve University
Wilberforce College
Wilmington College
Wittenberg College
Xavier University
Youngstown College

GERMAN PROFESSOR Dieter Cunz (left) meets with three promising scholars, all of whom received special grants supporting their graduate work in German. Left to right, Theofil Lant, graduate of Kent State University, is a Woodrow Wilson Fellow; Helmut Tribus, from Innsbruck, Austria, a Fullbright Scholar; and Stephen Wedgewood, Harvard graduate from Chappaqua, N.Y., also a Woodrow Wilson Fellow.

VISITING EXPERT Dr. Katherine M. Weimer, physicist at Project Matterhorn, Princeton University, here talking with Graduate Student William R. Riley, is one of many distinguished scientists who during the year visit the campus for seminars and meetings with graduate students and faculty. The first woman to receive her Ph.D. in nuclear physics at Ohio State University, Dr. Weimer is now on the staff of the special project at Princeton concerned with controlled fusion. Riley, Bellaire, O., native, graduated from Hiram College, is seeking his Ph.D. in Science Education and Physics.

FUTURE COLLEGE TEACHER Walter B. Laffer holds an assistant instructorship while he pursues work toward his Ph.D. in Mathematics. He received his baccalaureate degree from Case Institute of Technology.

School of the University is keenly aware of its responsibilities in this stage of history. College teachers must be prepared in increasing numbers. Promising young minds must be attracted and directed also into the channels of high-level research and leadership.

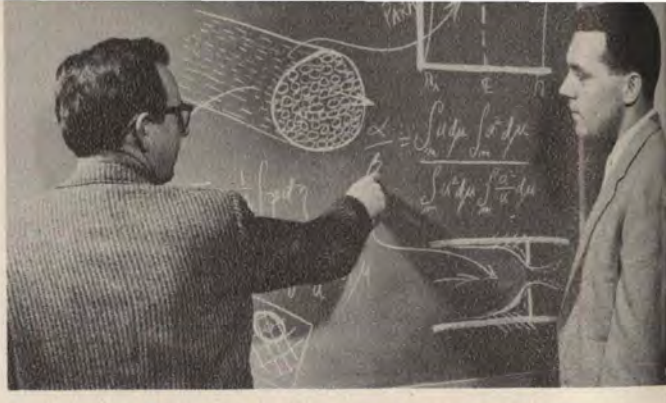
IT COSTS MORE TO
RUN A GRADUATE PROGRAM

The administration of an aggressive program of graduate education is a costly venture. Thus it costs more to operate Ohio State, not because the University has more students, but because many of the divisions of its complex nature, such as the Graduate School, require more expensive items than that required in the operation of a conventional undergraduate institution.

A study on the recent occasion of the 50th year of graduate education at the University of Wisconsin showed, in fact, that it costs about **four times** as much to educate a graduate student as it does to teach freshmen and sophomores in an undergraduate college.

But just as the cost of training men and women for high-level positions of leadership in education, business and research is higher, so is the need for leaders greater in every field of effort. The University cannot falter or fail if our way of life is to continue to flourish and progress — perhaps even survive.

POSTDOCTORAL STUDENT Dr. Phil. Eduard Stadelmann, here from Switzerland, came to Ohio State on a Mary S. Muellhaupt Postdoctoral Fellowship. There are four such postdoctoral fellows on campus, all of whom are continuing their research beyond the Ph.D. level. Dr. Stadelmann's special field is cellular physiology. Here he is observing cells of a section of plant tissue in a perfusion chamber. He expects to return next Autumn to rejoin the staff of the Institute of Botany of the University of Freiburg in Switzerland.



U.S. STEEL FELLOW William J. Conroy re-checks with Mechanical Engineering Professor Richard H. Zimmerman (left) solution to part of his thesis problem, which has to do with the theory of non-uniform flows. Conroy came to Ohio State from Illinois Institute of Technology where he received his Bachelor of Science degree in Mechanical Engineering.

JERRY B. LINGREL, U.S. Public Health Service Research Fellow in Agricultural Biochemistry, is a candidate for his Ph.D. in that field. Here he is operating a gas flow counter used to determine the amount of radioactivity in a protein. A graduate of Otterbein College, Lingrel's home is in Byhalia, Ohio.

"Man's future hinges on his ability to master his own mind," says the Ford Foundation's 1958 Annual Report. "His only salvation is through education: the cultivation of the skills and habits of intellect that are basic to all human achievement. The new dangers and opportunities defy past example, and so must man's efforts to expand the horizon of knowledge.

"The vigor of a nation and its educational level go hand in hand."

It is the special responsibility of the Graduate School to prepare the men and women for that leadership in education and research essential if America is to survive the challenges of that uncertain future.

The University Libraries

Largest Research and Academic Collection in Ohio

NO component of a distinguished university is more important to its vigor and vitality than a comprehensive and well-organized library. Ohio State is especially fortunate in having in its great University Libraries by far the largest research and academic collection in the State of Ohio. More than 1,300,000 volumes are available, ranking 17th in size of book holdings among the university libraries in the nation.

To meet the needs of a campus that stands among the top 10 in size, the University must not only keep pace with current new publications but seek always to complete and augment its special collections of past publications in the different fields of knowledge. A library must look forward and backward at the same time.

Despite an annual expenditure of more than $300,000 per year for the purchase of all types of library materials — books, periodicals, maps, microphotographic records, phonograph discs and rare manuscripts — there is the constant awareness of the need to do more.

RARE BOOK COLLECTION NEEDS ENLARGING

The University is seldom able to go into an exhaustive collection of library materials on any subject. Although it has a fine start on its rare book collection — always a costly venture — it needs further development in this area if it is to serve adequately those doing advanced work in the humanities, particularly in English, fine arts and history.

Notwithstanding financial limitations the present collections are increasing at an annual rate of approximately 80,000 volumes, a rate which is ninth among university libraries of the nation. Included are 12,500 periodical and serial titles, received regularly and added to the collections. In addition, the Libraries belong to the Midwest Inter-Library Center, a cooperative storehouse of less frequently used research materials containing more than 1,000,000 volumes,

(Continued on page 17)

The William Oxley Thompson Memorial Library

The Main Library's Largest Reading Room

Rare Book Room

A Library Carrel

Veterinary Medicine Library
in Sisson Hall

"With the development of great libraries, and collections, and the opening up of new sources of information, knowledge itself changes."

The Orton Hall Library

The Main Library's Circulation Desk — Distribution Point for Three-Quarters of a Million Volumes

"Books are the legacies that a great genius leaves to mankind, which are delivered down from generation to generation, as presents to the posterity of those who are yet unborn."

The University Libraries — Continued

maintained in Chicago by 20 cooperating research libraries.

Materials in the Midwest Inter-Library Center are regarded as part of the University Libraries and they are quickly available to faculty, students and research scientists on this campus in Columbus by two-way teletype communication — one of the distinctive services of the University.

SERVICES ALSO EXTENDED OFF CAMPUS

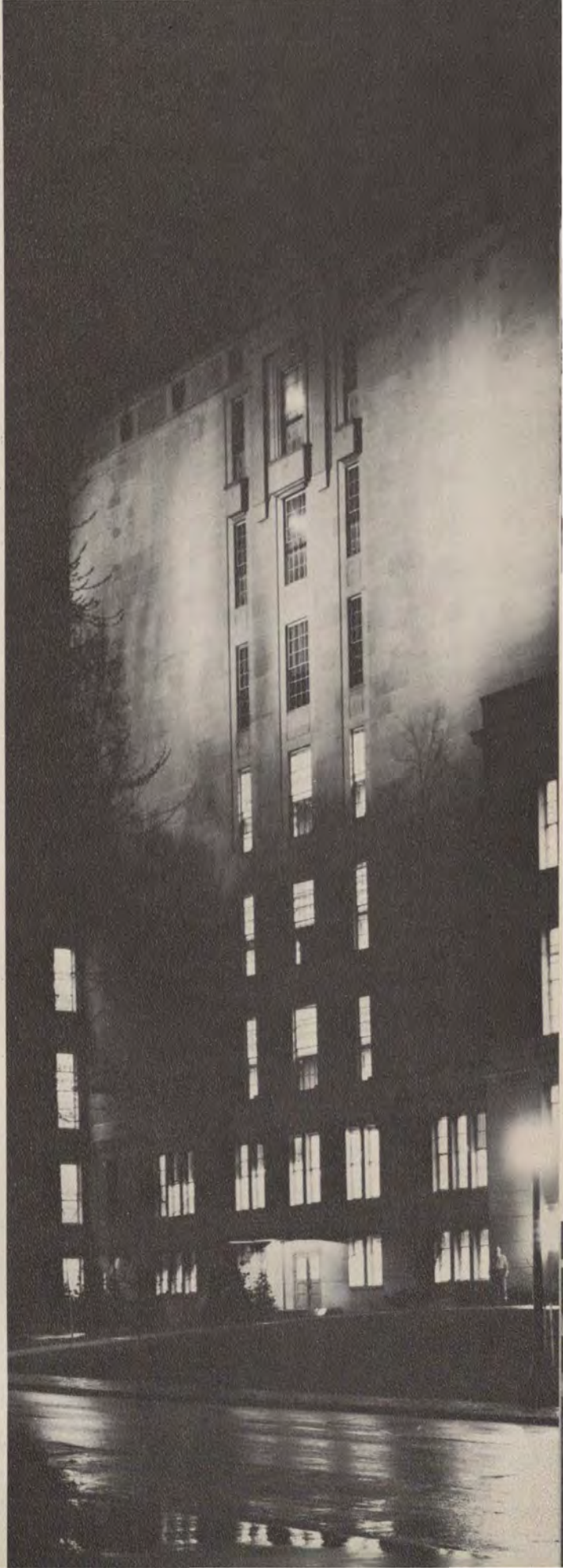
Although serving primarily the Columbus campus, the University Libraries make books and materials available to other libraries in the state and elsewhere. For example, the annual loans to other libraries reach more than 3,500 volumes. Ohio colleges and universities borrowed 745 volumes during the last school year.

The Reference Department of the University Libraries also extends its services beyond the University community. Various departments of state, the State Legislature and the five other tax-supported institutions of higher learning in Ohio are assisted at various times during the year. Private business and industry in Ohio are increasingly requesting and receiving reference assistance.

The Libraries are among the largest and most important research libraries in this country, holding membership in the Association of Research Libraries comprising 49 of the nation's largest research libraries. They participate with other great research libraries in such national cooperative projects as the Farmington Plan by which one copy of every foreign publication considered to be of potential research value is purchased and cataloged by one of the participating libraries.

NEW ACQUISITIONS ARE WORLD-WIDE

Through the Midwest Inter-Library Center the University shares in other programs of cooperative acquisition on a world-wide scale including foreign and domestic newspapers on microfilm, government documents of India and other selected countries,



The Library goes on into the night

A Library is books and more

dissertations of European universities and the infrequently used journals indexed in the *Chemical Abstracts* and the *Biological Abstracts.*

The collections on the campus show particular strength in American 19th Century literature, "little magazines" and avant garde literature, material on Shakespeare, Cervantes, Homer, printed medieval source records, and comprehensive journal collections in agriculture, chemistry and other disciplines of the physical and biological sciences. The Theatre collection contains materials drawn from the major libraries and museums of the western world.

To serve more effectively this large and complex campus, the collections of books and other materials are located in one main library — The William Oxley Thompson Memorial Library — and 30 department or branch libraries located in those campus areas of easiest access to the student group and faculty they are intended to serve.

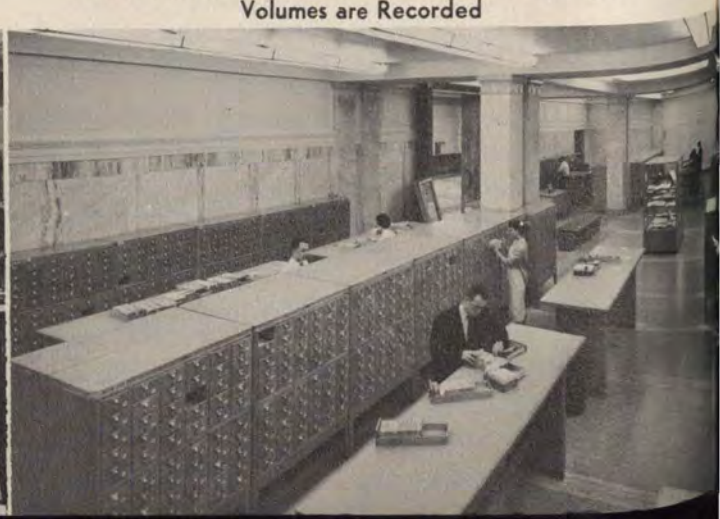
Through the great reservoir of books acquired during the 86-year life of the University and the aggressive program of current acquisition of new books and literature, students, faculty and others truly have immediate access to one of the world's great "storehouses" of knowledge.

SPACE AND PRESERVATION, two of the problems confronting the librarian, are solved in part, at least, in the Photoduplication Room. Here are housed micro-film cameras and other duplicating machines, where newspapers and other very bulky materials are put on film. Director of Libraries Lewis C. Branscomb (left) looks on as Stanley L. Farmann, Administrative Assistant, adjusts a foreign newspaper for filming.

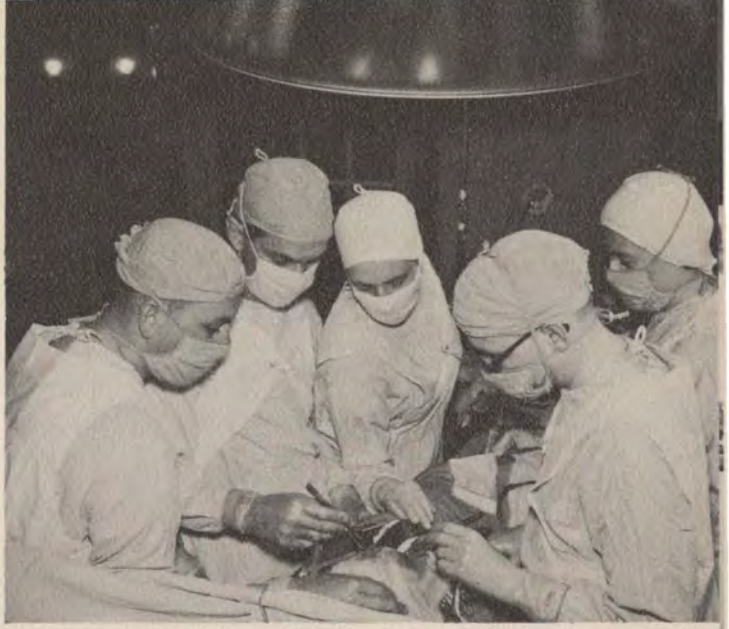
THE LIBRARY of Congress, Midwest Inter-Library Center — even the distant University of California Library System — are brought into immediate communication with the Ohio State University Libraries through the teletypewriter, thus opening to those on the Ohio State campus the rare and unusual treasures of the other great libraries of America.

The Browsing Room in the Main Library

The Card Catalog Room — Where Some 1,300,000 Volumes are Recorded



The University Serves All Ohio Through The Professions



DR. HOWARD D. SIRAK (second from left), noted for his research in heart surgery, here performs a heart operation, as two senior students at his side observe: William T. Coon, College of Medicine, and Ruth Hoge List, New Knoxville, O., School of Nursing. Coon did his undergraduate work at Ohio University. Assisting (right) are two staff members at Children's Hospital.

"MANY OF THE nation's most distinguished physicians, surgeons and dentists received their training at Ohio State. It is doubtful if there is any place in the world that has not been served in some manner by a person who received medical training at Ohio State University's College of Medicine."

This quote from the Ohio State *Journal* editorial page was in tribute to the oldest of The Ohio State University's professional colleges, which this year celebrated its 125th anniversary.

It might have been written of any of the nine colleges, nine special schools and of the Graduate School on the University campus. For all have made their distinguished contributions to leadership in their respective fields.

However, the emphasis in this year's Annual Report is narrowed to the extraordinary role and contributions of the University to the state in areas of special, advanced graduate and professional education, which are listed at the bottom of this page.

Besides the College of Medicine, the professional areas in which the University offers the only training among the state-supported colleges and universities are in the College of Dentistry, College of Law, College of Veterinary Medicine, College of Pharmacy, School of Optometry, School of Nursing, and School of Architecture and Landscape Architecture.

In three areas — Agriculture, Veterinary Medicine and Optometry — the University is the only degree-granting institution in the state and one of the few places in the nation where such education may be obtained.

Veterinary education, for example, is available at only 18 accredited institutions in the United States and two in Canada. Optometry, taught at only one other Big Ten school, is found at 10 other institutions in this country. Agriculture, established in

(Continued on page 20)

THE OHIO STATE UNIVERSITY

Only institution in Ohio granting degrees in

• **AGRICULTURE** • **OPTOMETRY** • **VETERINARY MEDICINE**

Only state institution in Ohio providing education in the professions of —

• **MEDICINE** • **DENTISTRY** • **LAW**

• **PHARMACY** • **VETERINARY MEDICINE** • **ARCHITECTURE**

• **NURSING**

College of AGRICULTURE and HOME ECONOMICS

THE TEACHING of agriculture has been a part of the curricula of the University since it was established in 1870 as one of the Land-Grant institutions of this nation.

Enrollment in agriculture and home economics has continued to increase as the total University has grown. Today, the combined enrollment in the two areas is largest in the nation. Agriculture alone ranks third in size, home economics seventh among the Land-Grant colleges and universities.

The impact of the College's resident instruction, extension service and research on agriculture in this state has been immeasurable. Ohio is a relatively small state — 35th in size — yet only eight states have as large an agricultural income — more than a billion dollars annually.

Nearly 40 per cent of all labor in Ohio is associated with the agricultural industry. About 300,000 work on farms, 450,000 are engaged in processing and selling farm products, and 300,000 are manufacturing and delivering equipment and supplies needed by farms.

Consequently, it is not surprising that only nine per cent of the agricultural graduates go back to farming, or that 54 per cent of the freshmen are from non-farm homes.

As the state grows industrially, more land is taken from farms. Thus the college has a growing responsibility to educate its students to be highly efficient operators of farms, technicians and managers of processing plants, merchandisers, and leaders of farm organizations, as well as being teachers and research scientists.

The Agricultural Experiment Station is closely correlated with the College of Agriculture and Home Economics with a budget annually of more than $3 million for research in the areas of production, processing, marketing, rural sociology and related fields.

The University is well aware of its unique responsibility in this state as the sole source of graduates educated in agricultural fields. Buildings are being added, facilities improved and enlarged and the curricula constantly evaluated to meet the needs of the changing agricultural community. Three new structures have been completed at a cost of $1,879,000, and another is in process, as the College of Agriculture and Home Economics expands its physical plant on both the East and West Campuses so that it may serve more effectively this dynamic area so vital to the welfare of society.

ON THE UNIVERSITY Farm, agricultural students in a class in swine production witness a demonstration in hog cholera vaccination led by Dr. William E. Davis (in cap), ambulatory clinician in Veterinary Medicine, assisted by a group of Juniors in Veterinary Medicine.

STORY OF NUMBERS employed in Ohio's agricultural industry is told on poster, here inspected by two graduate students in agriculture, M. Dwayne Yost and Glen Vollmar.

ENERGY EXPENDED in climbing stairways of various pitch and rise is being measured by Graduate Student Marjorie Keiser (seated at table) as part of original research directed by her. She is a candidate for her Ph.D. degree in Home Economics.

1862 as part of the basic program of the Land-Grant colleges and universities, is available at these institutions in each of the 50 states.

On the advanced graduate level, the University, as is pointed out elsewhere in this Report, also is unique in Ohio in the diversity of its offerings in the professional careers represented by its Colleges of Arts and Sciences, Commerce and Administration, Engineering and Education, as well as Agriculture and Home Economics. For example, the doc-

(Continued on page 27)

College of DENTISTRY including Dental Hygiene

OHIO STATE'S College of Dentistry and division of Dental Hygiene provide the major center for dental education in Ohio and the chief source for practitioners in these fields throughout the state.

Of the 744 undergraduate dental students from Ohio now attending dental colleges both in Ohio and elsewhere, 489 are enrolled in the University's College of Dentistry. Western Reserve University, the only other dental center in the state, shows an enrollment of 154.

Established in 1899, the College of Dentistry has undergone a relatively rapid growth during the past 13 years, a period in which the number of admissions to the College has more than doubled. Currently the College ranks first in size among the state-supported schools and fourth among all 47 dental colleges in the U.S.

The enrollment of 116 women in the Dental Hygiene curriculum of the College — the only such training available in Ohio — is the largest in the nation of any school connected with a dental college. It ranks third among all schools of Dental Hygiene.

Enrollment in the College has been increased as rapidly as facilities permitted. This Autumn the opening of the $1,191,000 addition to the Dentistry Building in the Health Center will enable the admission for the first time of 150 Freshmen dental students.

AS CLASS WATCHES, two advanced students in dental surgery operate on patient with the assistance of Dental Hygienist Patricia Bargar of Youngstown. Dr. William Ritter (left) of Rittman is a surgery interne in the College and Dr. John Lewis, a surgery resident.

A sizeable number of these newcomers will come from other undergraduate colleges in the state. This past year's Freshman Class, for example, included 56 who received their pre-professional training at other private, state and municipal colleges and universities in the state.

The unique services of the University to the communities of this state again is illustrated through the lives of its dental alumni. Nearly half of the 4,191 dentists practicing in the state received their dental training on this campus. The Ohio State alumni number 1,810.

Graduates are located in 86 of the 88 counties. In fact, in three counties — Pike, Pickaway and Union — all the practicing dentists are the products of this University. In 40 counties the majority of the dental practitioners are Ohio State alumni.

Through its program of continuing professional education the College annually provides its alumni and other dentists from Ohio and elsewhere with refresher courses to review the most recent developments in dentistry.

The College is particularly proud also of its graduate training in which the various facilities of the College of Medicine are utilized in a cooperative program of mutual benefit. The enrollment in this field of 17 full-time graduate students and 25 full-time postgraduate students ranks among the top ten in the nation.

TECHNIQUE of holding dental instruments is being learned here by Patricia Armstrong (left) of Euclid under the direction of Ann Kayser, Instructor in Dental Hygiene.

EACH STUDENT DENTIST has his own chair and cubicle in the Dental Clinic. Here Dr. John Beckwith, the instructor, checks on the progress of the student, Dave Rambo, Dayton.

College of LAW

LAWYERS, in their capacities as practitioners, judges, legislators and counselors are the major architects of the system of law designed to carry out the administration of justice. The ability of the lawyer to meet this responsibility in an increasingly complex society depends in major part upon the quality and thoroughness of his education and training.

The University's College of Law, the only state supported school of legal education in Ohio, has been a major constructive force in the administration and development of the law in this state since 1891. It has been a model for high standards in its educational requirements. Its graduates, serving in every county except one, have distinguished themselves as practicing lawyers, and as jurists and legislators.

Among the 1,974 graduates now engaged in the practice of law in Ohio, two are members of the Ohio Supreme Court, forty are common pleas judges, eight serve on courts of appeal, sixteen are municipal judges, twelve are probate judges, seven are county judges, and twelve are members of the 103rd Ohio General Assembly.

Some idea of the impact of the College's graduates on the communities of this state is illustrated by the following examples:

In Muskingum County where there are 60 lawyers, 34, including the common pleas and municipal judge, are Ohio State graduates.

In Delaware County, 13 of the lawyers, the common pleas judge and the probate judges are graduates, out of the 21 lawyers in the county.

Ross County has 44 lawyers. Sixteen of these, including the common pleas and municipal judge, are graduates of the College.

In a great number of the other counties of the state, half or more of the practicing attorneys are law alumni of Ohio State.

The College of Law recognizes its continuing responsibility for maintaining this flow of quality-trained lawyers into positions of leadership in their profession. To this end it has regularly re-evaluated its educational program in an attempt to prepare its graduates for the immediate practice of law. The current "Ohio State" plan of legal education, which trains students in the practical application as well as in the theory of the law, has been studied and emulated by other leading law schools of the nation.

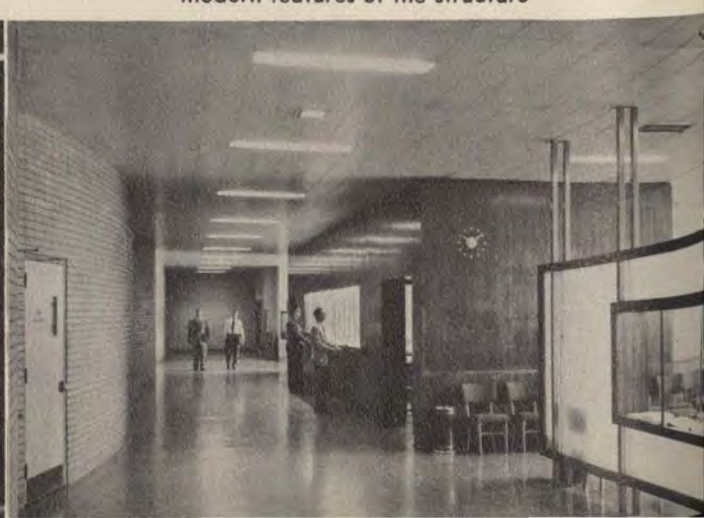
NEW BUILDING of the College of Law

The College's new $2,500,000 building, to be fully occupied this Autumn, will further the administration of such an educational program. The structure, second to none in the nation, provides seminars, library, courtroom, legal aid clinic and other facilities so that the student may be experienced in the tools as well as the traditions of his profession when he embarks on the practice of law.

A new era of even greater leadership in the legal profession in this state appears to be dawning for the College as it moves into its magnificient new home.

THREE JUSTICES of the Ohio Supreme Court occupy the bench during a student Moot Court hearing

CORRIDOR in the new Law Building gives some idea of modern features of the structure



THE EXPERIENCED HAND of Dr. Bruce K. Wiseman, Chairman of the Department of Medicine, is watched by two medical students as they accompany the veteran doctor and educator on his rounds. Left is Jerry L. Stevenson, transfer from Bowling Green State University, and Jon Paul Tipton, from Ohio University. Both men are Juniors in the College of Medicine.

College of MEDICINE

LARGEST AND OLDEST of the professional colleges on the campus is the College of Medicine, which this year celebrated the 125th anniversary of its founding.

Although a part of the University only since 1914, the College of Medicine dates its origin from 1834 when it was established in Willoughby, O., as the Willoughby Medical College. It moved to Columbus in 1847 and absorbed or joined with four other medical schools before becoming a part of this University.

In few areas has the University rendered more distinguished service to this state. Annually some 140 men and women complete their four years of professional training in the College of Medicine for their M.D. degrees. Its alumni, practicing physicians and surgeons in every county of Ohio, total 2,350 in this state alone.

The State of Ohio is fortunate in having within its borders three fine medical colleges, including those at the University of Cincinnati and Western Reserve University. The Ohio State College of Medicine is the largest of these three, admitting an entering class each year of 150, fourth largest among all medical schools in this country.

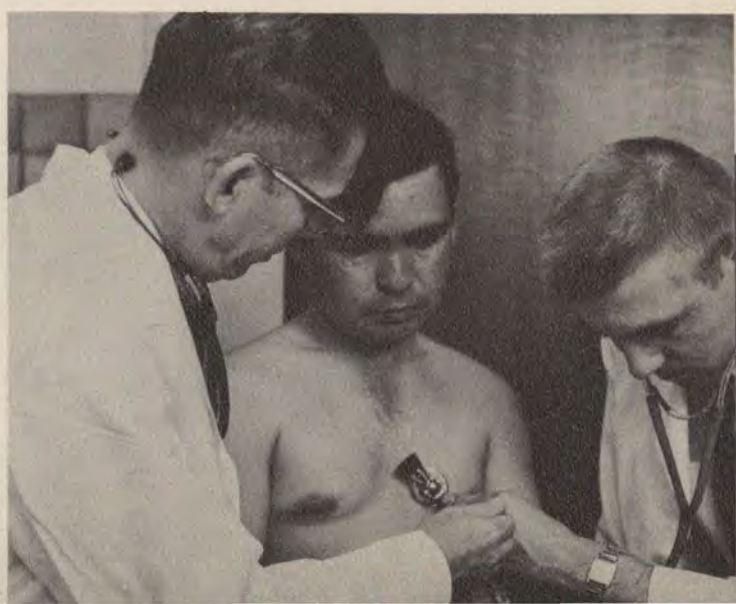
As the only state-supported center for medical training, the University provides the medical education outlet for students from the other state universities, as well as those from private and municipal schools in Ohio. In this year's medical graduating class, for example, there were 53 seniors who had completed their pre-professional training at 19 other Ohio colleges and universities. This year's freshman medical class included 21 students who had completed their pre-professional training at four state universities, Ohio University, Miami University, Kent State and Bowling Green.

The College ranks first among the medical colleges of the nation in its advanced training for doctors who have completed their work for the M.D. degree. Residency training programs, providing from one to four years of advanced work, are available in 29 different special fields of medicine.

Civilian Aviation Medicine can be cited as an example of the leadership of the College of Medicine in the residency and graduate field. Ohio State offers the only such civilian program in the nation. It was started in 1955 in response to the need for serving the special medical problems of an industry that now includes 80 airlines, carrying nearly 40 million passengers a year, and some 250,000 noncommercial civilian pilots.

The University Health Center is the major medical research center in Ohio. Here are focused the talents and knowledge of a large and distinguished medical faculty and staff on all of the ramifications involved in the common problems of human health and disease. And, as elsewhere on the campus, students share with their instructors in the experiences of investigation and discovery.

As a leader in medical education and research in the state, the University is constantly impelled by the urgency of its unique opportunity to serve. Thus its admission standards are high, the demands on its students are strict, and its search unrelenting into the causes and cures for human suffering. In what finer way could it fulfill its obligations to the society from which comes its support?



LEARNING BY DOING is David H. Sheidler (right), Senior medical student here checking the heart beat of a patient in the out-patient clinic of the University Hospital. Dr. H. Campbell Haynie, Associate Professor in the College of Medicine, assists in the examination.

School of NURSING

THE UNIVERSITY'S School of Nursing makes its distinctive contribution in those areas of nursing requiring high-level preparation. Although 67 per cent of the positions involving nursing care could be filled by nurses prepared in three years or less, the other 33 per cent require baccalaureate or more advanced training, according to a recent study by the National League for Nursing.

There are only six nursing schools in Ohio prepared to provide advanced training, these representing only 10 per cent of all nursing training programs in the state. The University's School of Nursing, the only state school in Ohio, offers two types of nursing programs, Basic and General, leading to the Bachelor of Science in Nursing degree, and graduate training leading to the Master's degree.

The School has been particularly fortunate, through the cooperation of the Ohio Department of Health, to include preparation in public health nursing for its undergraduate students. Only 16 other colleges and universities in the U.S. have received accreditation by the National League for Nursing for all of the types of programs offered by this University in nursing. Among the Big Ten schools, Ohio State has the only School of Nursing so accredited.

The School has undergone a remarkable growth in recent years with the number of graduates during the last five years quadrupling that of the five-year period of 1943 to 1948. Graduates have been employed in 51 of Ohio counties. A recent study indicates that 60 per cent of the graduates are still active in nursing, despite the inroads of marriage and childbearing.

As recently as 1956 Ohio State was enrolling 43 per cent of the collegiate nursing students in the state. The future holds new challenges for nursing preparation in Ohio. The state's present ratio of nurses per 100,000 (232) is below the national ratio (258). A ratio of 300 is needed to assure adequate care of the sick. Aware of its greater responsibility as the leading institution in its field in the state, the School of Nursing is constantly exploring better methods for increasing as well as improving its training programs.

AN AID FOR the partially blind is demonstrated here by Professor Vincent J. Ellerbrock (right) to Optometry Senior Benjamin Binns of Portsmouth. This "projection magnifier" was one of several instruments developed following a survey by Dr. Ellerbrock showing the widespread need for such devices among the partially blind. Binns completed his pre-optometry training at Ohio University.

School of OPTOMETRY

THE SCHOOL OF OPTOMETRY is one of only 10 institutions in the United States and two in Canada where men and women may prepare themselves for this profession. It is the only such school in Ohio. In the Western Conference one other institution — Indiana University — offers such training.

Since it was established on this campus in 1914, the School has produced 825 graduates of whom 490 are now practicing in Ohio. At least one Ohio State-trained optometrist will be found in every county of the state except three.

Approximately a third of the present student body completed its undergraduate preparation (minimum of two years) at universities and colleges other than Ohio State, 15 at other Ohio Colleges.

Educational requirements of the School include three years of professional study leading to the Bachelor of Science in Optometry degree.

A notable contribution of the School has been in the training of teachers. Ten graduates have continued their work toward the Ph. D. degree and are now teaching at Ohio State and at other universities, including two colleges of medicine.

CLASS IN NURSING watches demonstration by Frances A. Rings, Instructor.

MOTHER GETS some suggestions on child care during a home visit by Student Nurse Mary J. Adams of Cincinnati.

College of PHARMACY

THE COLLEGE OF PHARMACY set the pattern for pharmaceutical education when in 1948 it introduced the first required five-year curriculum in the United States. The validity of this position has been sustained since.

Beginning in 1960 all member colleges of the American Association of Colleges of Pharmacy will require completion of a five-year curriculum for graduation. The American Council on Pharmaceutical Education, the accrediting body for colleges of pharmacy, will make this curriculum a requirement for accreditation in this country.

The five-year requirement has tended to lower the enrollment at Ohio State since it has been the only one of the four colleges of pharmacy in the state and one of less than 20 in the U.S. with such a standard. Despite this fact, enrollment is increasing, with last year's entering class showing a gain of 20 per cent and the current entering class is up 30 per cent.

Prospective students in pharmacy may complete their required two years of undergraduate training at any liberal arts college or university. During the last 10 years 47.5 per cent of them did their pre-pharmacy work on some campus other than Ohio State. Alumni of the college are serving as pharmacists in 81 of the counties of Ohio, representing between 20 and 25 per cent of all the pharmacists in the state.

The College claims particular distinction for its graduate program, a field in which it is equalled by less than 20 colleges of pharmacy in the U.S. (none in Ohio). The Ph. D. degree is offered in all five areas of the pharmaceutical curriculum — pharmacy, pharmaceutical chemistry, pharmacology, pharmacognosy and pharmacy administration.

Of the 49 Ph. D. degrees granted since 1943:

SPECIAL PROJECT in pharmacology here occupies the attention of Ronald G. Babington (seated), second-year pharmacy student from Miamisburg, as Dr. John W. Nelson advises. Babington entered study of pharmacy at Ohio State after completing pre-professional training at Miami University.

two of the recipients are now deans of colleges of pharmacy,

27 are members of the faculty in 23 different colleges of pharmacy in this country and abroad,

15 occupy responsible research, administrative and managerial positions in 11 different companies in the pharmaceutical industry, and,

three are in governmental service here and in foreign countries.

The quality of both its graduate and research programs is such as to attract not only outstanding students but financial support from the pharmaceutical industry and other sources for research fellowships. During the current year, for example, the National Institutes of Health awarded four separate grants-in-aid in amounts ranging from $2,300 to $63,000 in support of research for periods of one to three years.

GRADUATE STUDENTS Albert Edlin (left to right) and James P. Leyda check drugs being immersed in a constant temperature bath in a pharmacy laboratory. Instructor is Dr. Loyd E. Harris. Edlin, from New York City, received his B.S. degree at the University of Cincinnati, and Leyda, a Youngstown resident, his degree from Ohio Northern University.

EFFECTS OF gibberellic acid (known to stimulate growth of plants) on paramecium, a small unicellular animal, is one aspect of a joint special problem being studied by Albert Oravec (left), Akron, and Nick Strovilas (right), Toronto, O., under direction of Dr. Arthur Tye. Oravec did his pre-pharmacy work at Kent State, and Strovilas at College of Steubenville.

ONE OF THE FINEST Guernsey herds in the United States provides clinical experience for students in Veterinary Medicine at the Anson Smith Farm near Hilliard, O.

College of VETERINARY MEDICINE

DR. MARK FRANCIS, the first graduate of Ohio State's College of Veterinary Medicine, laid the groundwork for the eradication of the Texas Fever tick and thus made possible a healthy, thriving livestock population in the southern states.

Dr. Stanton Youngberg, '07, while Director of Agriculture in the Philippines, was able to control rinderpest, a disease of cattle, which removed one of the major obstacles to cattle production on the islands.

Disease recognizes no boundaries. Any contribution made anywhere for the improvement of animal health, making possible more profitable animal production, helps protect the health and well-being of man everywhere. More than 100 diseases are known to be transmissible from animal to man.

It would be impossible to evaluate in dollars and cents the contributions by the veterinary graduates of Ohio State. Largely through their efforts and those from the relatively few other veterinary colleges in this country (only 17 others) the people of the U.S. are able to have ample supplies of meats, milk, eggs and many other animal products without fear of disease.

The importance of veterinary medicine to a healthy livestock industry was recognized by the founders of Ohio State and courses in this field were included in the first curriculum for students in the College of Agriculture.

In 1885 veterinary medicine was established as a separate course of instruction leading to a degree (now a six-year program requiring two years of pre-professional college study and four years of college professional training). During the ensuing 74 years the College has graduated 2,553 veterinarians, the largest alumni body of any such college in the United States.

Approximately 2,000 are still active in their profession, with 40 per cent of these located in Ohio. The importance of these veterinarians to this state is illustrated on the Ohio map appearing here which shows that in 25 counties all of the practicing veterinarians serving the community came from Ohio State and in all save a few counties the greater percentage are products of the University.

So great and widespread is the need for veterinarians, and so limited the supply, that Ohio State graduates find their opportunities for practice literally all over the United States and abroad. There is at least one Ohio State veterinarian in every state in the union.

Since World War II the demand for veterinary education has reached an all-time high. Eight of the present 18 colleges have been established since 1948. The annual number of applicants for admission to the College on this campus has ranged from more than 400 to presently about 200. Facilities of the College limit the entering class to 72, with 10 per cent of this number admitted from neighboring states having no veterinary college.

Ohio State's College of Veterinary Medicine on June

UNDER THE SUPERVISION of Dr. Vernon L. Tharp (left), Director of the Veterinary Clinic, and Dr. Harold E. Amstutz, Chairman of Veterinary Medicine, students check condition of a champion Aberdeen Angus bull.

DR. LeROY E. JOHNSON (left), Professor of Veterinary Surgery, explains to a group of veterinary students the application of radioactive cobalt in treating a leg injury on this valuable race horse in the Veterinary Clinic.

16, 1959, dedicated Sisson Hall, the first new building in an expansion plan for the college on the University's West Campus. The fulfillment of this plan within the next few years will provide the new and up-to-date facilities needed for this state to live up to its unique responsibilities and opportunities in this vital area.

ARCHITECTURE and Landscape Architecture

THE GROWTH of The Ohio State University has been directed toward providing education and research that meets the needs of society. Practically all areas of knowledge are now represented in its course offerings and research projects.

Most recent example of this growth process came in the School of Architecture where the first and only graduate program in Ohio in city planning was introduced a year ago. The need for trained planners in the state prompted this action.

Community planning is rapidly being adopted by urban areas of Ohio to cope with the problem of growth. Ohio's population is expected to increase from the present 9½ million to more than 13 million by 1980. Many Ohio cities and counties in recent years have been unable to find trained planners for key positions. The first University graduates specializing in this field are expected in 1959-60.

Architecture is taught in four accredited schools in Ohio; landscape architecture only at Ohio State. The University is the only tax-supported institution in the state to teach these subjects.

The School, a part of the College of Engineering, is 20th in size among the 70 schools in the U.S., with an enrollment of approximately 200 in the five years required for graduation. Graduates represent some 21 per cent of all registered architects in the state.

The University Serves —— Continued from page 20

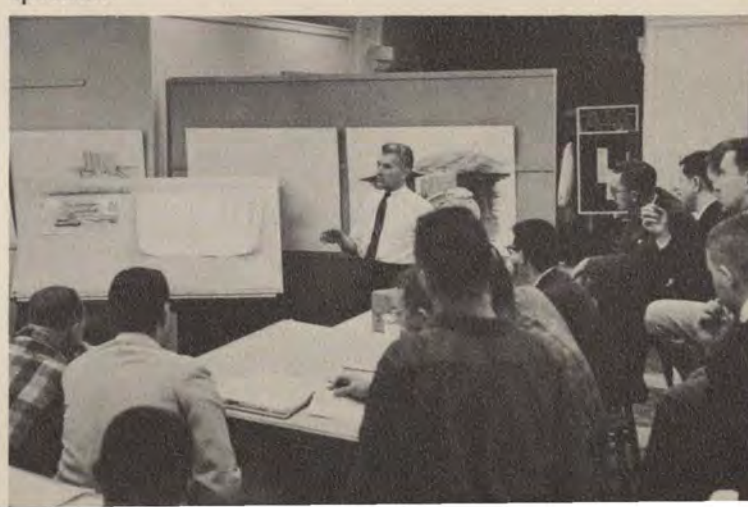
toral degree is available in nine different fields of engineering, the various special business professions, and in education leading to preparation for professional careers as school administrators and college teachers.

The colleges of Ohio look to the University as a center for professional training. Many students currently enrolled at the University, some of whom are pictured in this section of the Annual Report, are transfers or graduates of other private, municipal and state universities in Ohio and elsewhere.

The citizens of Ohio look to the University as a source of professionally trained men and women. Most of the graduates of these professional areas, as well as those who earn their baccalaureate degrees on this campus, return to communities in this state.

This fact is dramatically illustrated in many counties of Ohio where often all or a majority of the doc-

STUDENTS AND STAFF assemble in one of the drafting rooms for an informal lecture by a visiting architectural specialist.



tors, dentists, lawyers, veterinarians, optometrists, nurses, pharmacists and architects are graduates of The Ohio State University.

"No state university achieves and retains a level of true greatness unless it links itself closely with the lives of its citizens," President Fawcett said in his inaugural address. Often that greatest link is through the graduates, who, particularly in the professions, serve so directly and intimately so many of their fellow Ohioans.

Advanced Education is EXPENSIVE

PROFESSIONAL and Graduate education is necessarily expensive. As an illustration, it is impossible to teach the mathematics of computers without a computer laboratory. During the next three years, the University will invest $395,000 in the computer laboratory from the Mershon Fund, in addition to government and foundation grants and other normal sources.

Nuclear physics and nuclear engineering demand costly facilities. A teaching reactor is now in the contract stage with $217,000 of Atomic Energy Commission funds committed, in addition to approximately $100,000 in University funds. And this is only the beginning.

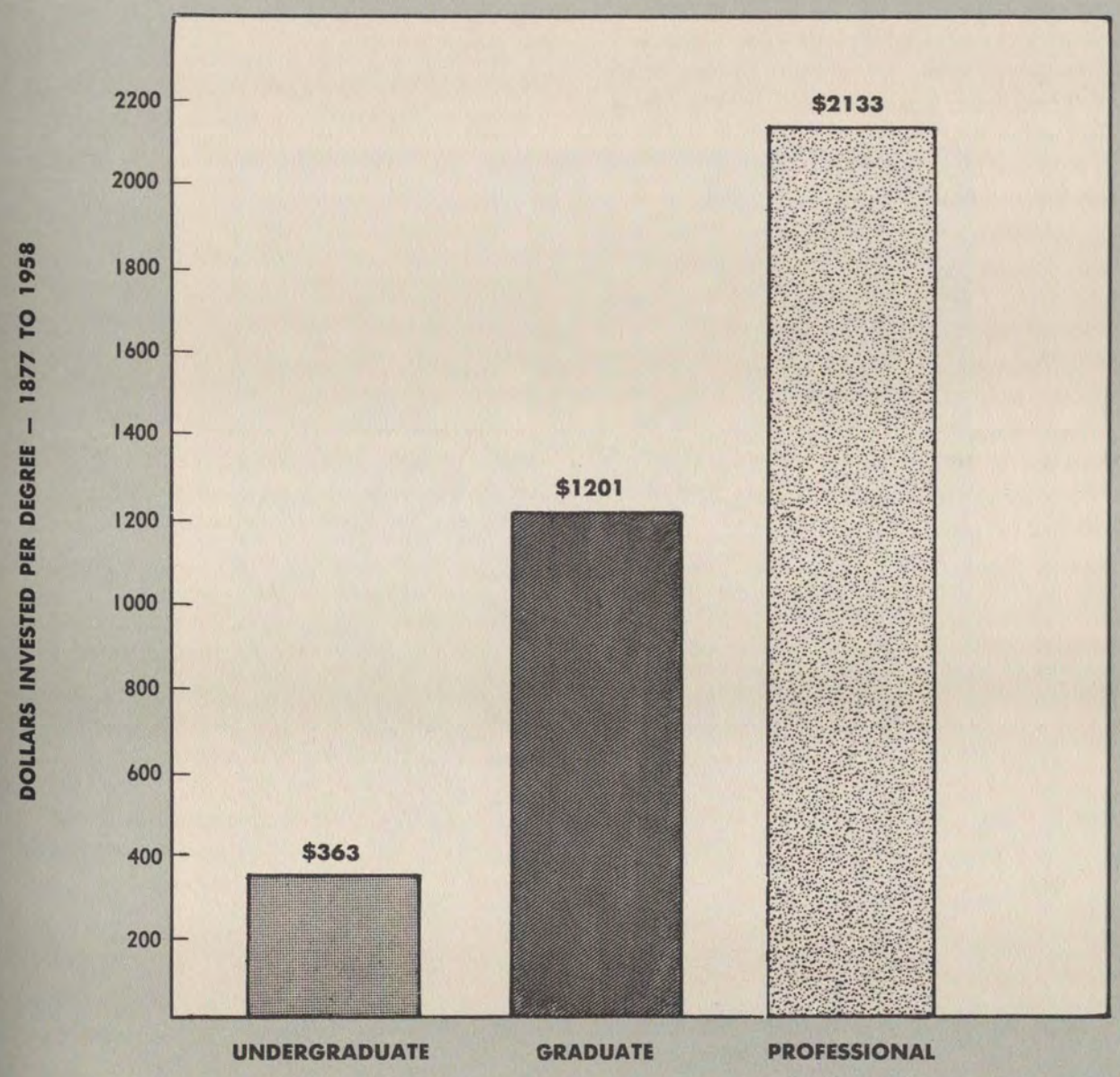
The most graphic difference between the costs of undergraduate education and those of professional and graduate areas may be seen by comparing the capital investment necessary for degrees granted in each area. The chart on page 29 illustrates these differences. To prepare the chart the total of all capital expenditures for building and equipment since the start of the University and through April 30, 1959, was divided by all degrees granted in the respective areas through June 30, 1958, to provide a per degree investment comparison.

Undergraduate students greatly benefit by the presence on campus of equipment procured expressly for the graduate students. Often the undergraduate

(Continued on page 30)

THE UNIVERSITY is in process of adding an IBM Type 704 Electronic Data Processing System, like the one shown here, to its Numerical Computation Laboratory at the Research Center. This addition will make available for research and professional training one of the most modern calculators available. The machine can perform approximately 40,000 additions per minute. The present computer is an IBM 650 Magnetic Drum Calculator.

CAPITAL INVESTMENT PER DEGREE
1877 to 1958

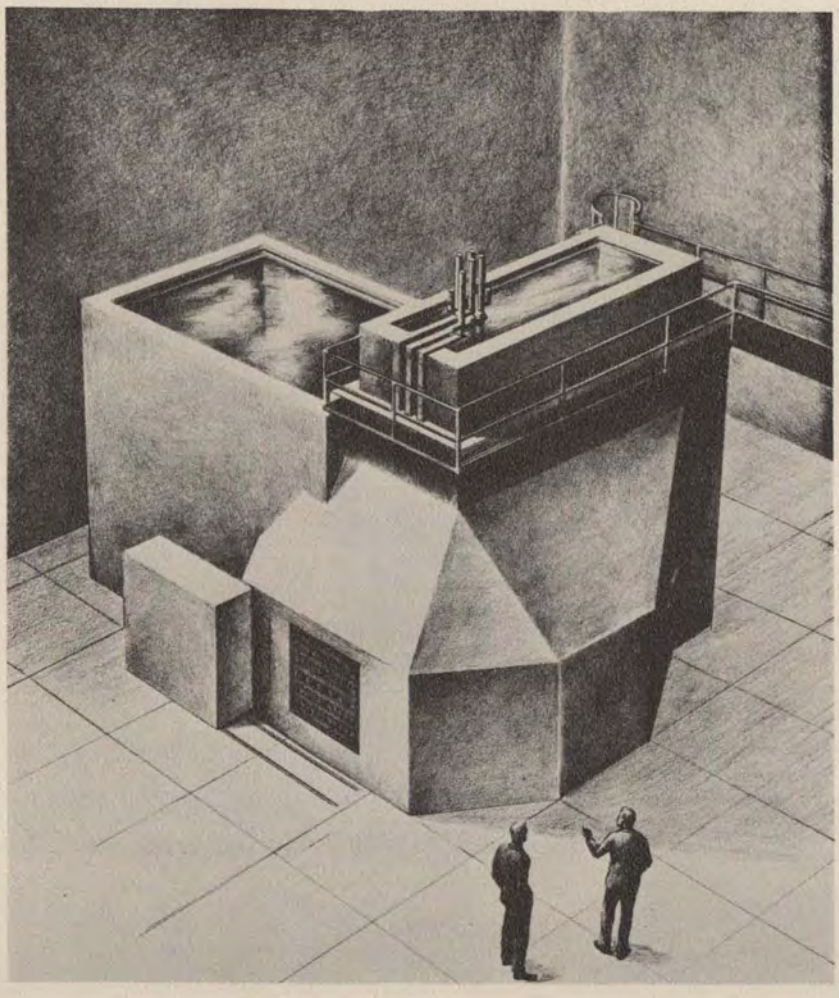


laboratories can make use of such apparatus in the regular course of instruction. The added volumes in the library also enrich the student's undergraduate experience.

It is interesting to note that graduate education requires more than three times the investment required by undergraduate instruction, while the professional colleges require almost six times as much for laboratories and equipment.

The future economic stability of Ohio depends upon the genius of its citizens in developing new enterprises geared to the needs of future eras. Such genius is produced only through the continued effort of graduate and professional programs such as those at Ohio State. Because advanced study and research requires such financial support, it is unwise to attempt to decentralize it, and incur far higher per capita costs.

The unique role of Ohio State is to provide a mecca to which graduate and professional students may come for inspiration, rigorous learning and stimulating research.



THIS IS AN ARTIST'S CONCEPTION of the 10-kilowatt nuclear training reactor which Lockheed Nuclear Products is building for the University. It will be 20 feet high, 19 feet long, and 24 feet wide, including a "swimming pool"-type reactor section and a special pool for bulk shielding experiments. The University will use the reactor to train undergraduate and graduate students in nuclear physics and engineering through laboratory sessions and controlled experiments that cover the entire range of reactor capability. The cost will be about $317,000.

Opening the Way for Progress

The Ohio State University Research Center

IN THIS the atomic, electronic and space-flight age, the great universities of America find themselves in positions of critical responsibility in the nation's effort to maintain its economic strength and to keep pace in the research race for survival.

The launching of the Sputniks has dramatized this challenge and has served not only to bring to public attention the importance of the university researcher and his student aides but to heighten the interest and spur the research efforts on these campuses.

At The Ohio State University the different areas of research are as numerous as the areas of knowledge represented by the curricula of the 84 departments of instruction which make up the educational structure of the University's 10 colleges, Graduate School and nine special schools. These encompass practically every area of human development.

From the Health Center and Research Center,

Research

where physiologists and physicians explore the problems of aviation medicine, to the Rocket Research Laboratory, where engineers are running tests on missile fuels, the research program on this campus is as timely as tomorrow's headlines. Meanwhile the search for the answers to human ills and explorations into dozens of perhaps less dramatic but equally important problems in the physical and social sciences and the humanities continues both on the campus and off.

RESEARCH HAS NO SINGLE "HOME"

Research has no single "home" on the campus. Contract research (257 projects, valued at approximately $4,800,000 in 1958-59) is handled by the Ohio State Research Foundation and much of it is conducted in the Research Center building on the West Campus. The Antenna Research Laboratory is next door. The Health Center on the southern edge of the campus is the location for most of the medical and dental research in progress.

Other projects are pursued off campus, as at Children's Hospital in Southeast Columbus; Perkins Astronomical Observatory, near Delaware; Stone Laboratory on Lake Erie; and the Agricultural Experiment Station at Wooster. Don Scott Field, the University's airport, located seven miles northwest of the main campus, is the home of the Research Laboratories of Aeronautical Engineering where problems of high-speed flight and missiles are being studied.

The Engineering Experiment Station on the northern edge of the campus has a history going back to 1913 when it was established by an act of the Ohio Legislature. Some idea of the inter-relationship of research and the teaching program of the University is illustrated by projects at the Station.

Last year this Station completed 52 research ventures into the fields of chemical, civil, ceramic, and

UNIVERSITY HOSPITAL — North Wing (right), where much of the Health Center research is located, was nearing completion when this picture was taken in April, 1959.

CANCER DRUGS — "Atomic" medicine moved into its 19th year at Ohio State this academic year establishing itself as one of the oldest medical research programs of its kind in this relatively new field of medicine. Dr. Charles A. Doan (left), Dean of the University's College of Medicine is an internationally famous authority on blood diseases. In 1940 he and Dr. Bruce K. Wiseman, Chairman of the Department of Medicine, initiated research in the development and use of radioisotopes for medical therapy and diagnosis. Here in the Hematology Clinic Dr. Doan administers to a patient an "atomic cocktail" made of radioactive phosphorus and water. The medical technician is Joyce Butterworth. Radioactive phosphorus was first received from the Lawrence Cyclotron in California. Erection of the Ohio State cyclotron in 1941 enabled the Doan-led research team to receive radioactive phosphorus from the campus atom-smasher. Thus University scientists were some five years ahead in the evaluation of Phosphorus-32 therapy for blood diseases. As a result, the University Health Center was one of the first two such centers in the world to have a well-defined program of this kind. Clinical radioisotopes procedures now average more than 5,000 each year at the Ohio State University Health Center alone.

metallurgical enginering, operations research and community development. Seventy-five graduate students — many of whom used their research projects for their advanced degrees — and 128 undergraduate students were involved in various research and service capacities. Fourteen master's theses and doctoral dissertations were completed in cooperation with this research work.

SOME AREAS OF DISTINCTION ILLUSTRATED

This Section of the Annual Report singles out some of the areas of research on the Ohio State campus in which the University is distinctive. It is not an exhaustive description of the University's total research program. Such a presentation would require a voluminous report of its own. However, this Section does show, primarily through illustrations, many of the major projects and the distinguished faculty-scientists behind these projects, and some of the graduate students and postdoctoral fellows involved in the work.

Research opportunities on a university campus provide the means by which the graduate and postdoctoral student, and often those seeking degrees in the professions, come to grips with the unknown. Working usually under the supervision of an instructor, the student makes his own contribution to the project and finds inspiration as well as technical skill for pursuing his own future explorations.

Scientific understanding built up in the great

AVIATION MEDICINE — Pioneer in Aviation Medicine, the University offers in the Health Center a unique three-year residency training program for medical graduates, and provides at the Research Center one of the few aviation medical research programs in the nation. Prof. Fred A. Hitchcock (right) of Physiology, nationally recognized leader in such research, here demonstrates with the aid of two Ph.D. candidates in Aviation Physiology, the use of the decompression chamber. The students are Ken Coburn (in lab coat), a career man in the Navy, and Fred Thiede, Kalamazoo, Mich.

universities of this nation flows eventually into industry. Dr. George J. Huebner, Jr., research executive at Chrysler Corp., explains it this way:

"The large number of major industries which did not even exist 50 years ago, and the fact that more than half of the products manufactured today can be traced directly to research laboratories, indicates that our high standard of living and our growing economy in the United States are no longer based on natural resources and fortunate geography, but on scientific research."

He added, "It is safe to say that no large corporation today can continue to exist without research, and it is equally true that no state in this nation can continue its economic progress in relationship to the nation as a whole, without major research activity within the state, and a scientific and cultural climate in which it can flourish."

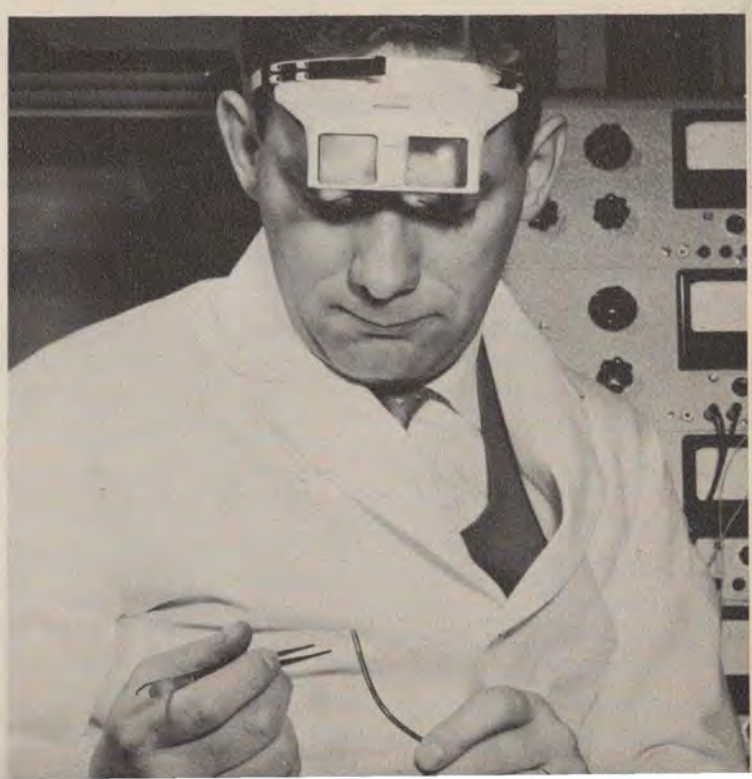
Research does not always have the quick payoff, the immediate application to the solution of man's ills or problems. Often it is a search into the unknown simply to satisfy the intense curiosity of the scientist. From such basic exploration, however, come some of our greatest discoveries. As one scientist puts it, "Basic research provides the real foundation for our technical progress."

RESEARCH BRINGS MANY BENEFITS

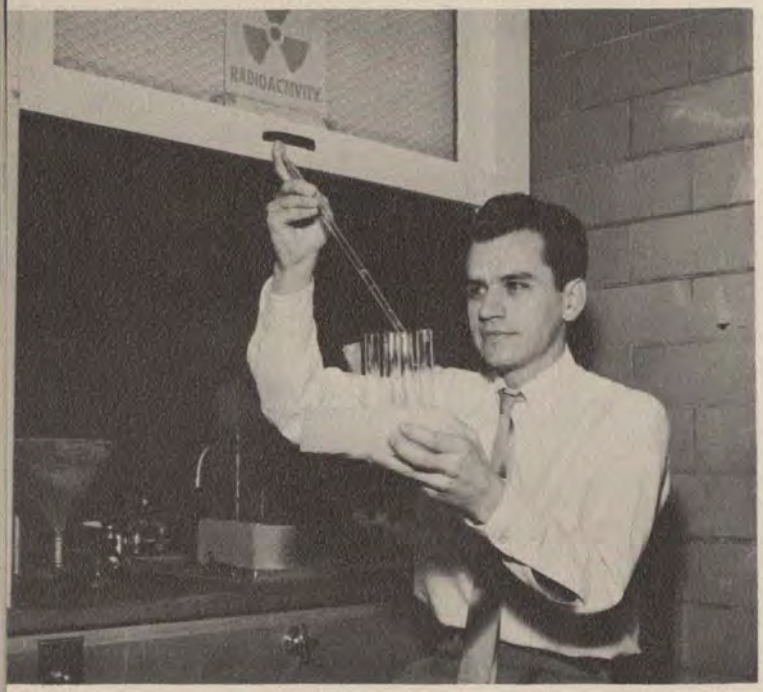
The benefits of research are many and varied. They have included the development of new energy

PRENATAL COMPLICATIONS AND INFANT ABNORMALITIES — A research project aimed at determining if there is any relationship between certain prenatal complications in pregnant women and mental or physical abnormalities in their infants is one of many studies being undertaken by the University's famous and productive husband-wife medical team. Dr. Benjamin Pasamanick is Director of Research at the Columbus Psychiatric Institute and Hospital on the campus. His wife, Dr. Hilda Knobloch, is Director of the Clinic of Child Development at Children's Hospital, Associate Professor of Pediatrics and Assistant Professor of Psychiatry. Some 700 surviving infants of mothers who had certain prenatal complications are being studied at ages 16, 28 and 40 weeks, for comparison with a control group of some 800 infants whose mothers had no prenatal complications.

Research



MINIATURE BLOOD FLOW METER — Dr. Heinz Pieper here holds a heart catheter, the end of which contains a tiny transformer, perfected by him, for measuring blood pressures within the heart. This instrument represents one phase of his research in the area of miniature meters as an aid to diagnosing and correcting heart ailments. He has now completed his work on a tiny blood flow meter, which enables the measurement of very rapid changes in the blood flow entering or leaving the heart of the patient. The catheter shown here can be inserted through a vessel in the arm and pushed into the heart where the transformer picks up the blood pressure and conveys by electrical impulse these pressures to the special electrical amplifier seen in the background. Heart catheterization is used for diagnostic purposes before surgery. It enables the surgeon to know beforehand whether the condition is operable. Native of Bavaria, Dr. Pieper came to the University in 1957 on a five-month appointment as a Research Associate in Physiology, stayed to become Assistant Professor in that department to continue his work under grants from the Bremer Foundation and Central Ohio Heart Association.



AGING OF CELLS — What happens in the aging of cells? Dr. Joseph E. Varner, Professor of Biochemistry in the University's College of Agriculture and Home Economics, has found indications that enzymes (agents which speed up chemical reactions in cells) associated with aging processes in plants are manufactured in the cells immediately before senescence (aging) begins. From these studies there is evidence that many of the biochemical changes characteristic of aging plant cells require energy, and that the cellular energy available is closely controlled by a hormone-like substance carried to the aging cells from other parts of the plant, he says. The young (37 years old) Ohio State biochemist's present studies are aimed at identifying this controlling substance and at understanding better the specific biochemical changes characteristic of aging cells. Dr. Varner will go to Cambridge University in England next September for a year as a National Science Foundation Research Fellow.

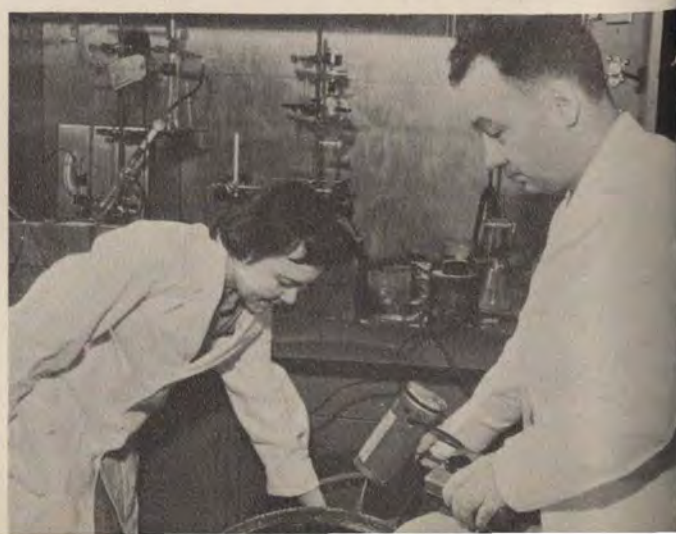
RADIODIAGNOSIS AND RADIOTHERAPY—Every day throughout the world between 5,000 and 10,000 human beings are treated for cancer with radio-active cobalt and this number may be doubled or trebled within a decade when more of the cobalt-60 radiation machines become available. Probably the first to advocate this use of radiocobalt was Dr. William G. Myers, Research Professor of Medical Biophysics, at Ohio State. This was in 1948. Today teleradiocobalt (meaning radioactive cobalt at a distance) has virtually supplanted teleradium in cancer therapy. The Ohio State Health Center's new therapy addition will have two of these cobalt "bombs" in its radiation section for this kind of treatment. Dr. Myers, shown here in one of his laboratories with an aide, is currently working on cobalt compounds for diagnostic purposes.

TEST TUBE PROTEIN — Distinction of being the first American scientist to produce protein, the basic unit of life, in a test tube is held by 34-year-old Dr. George C. Webster, Associate Professor of Agricultural Biochemistry. "Protein molecules," he explains, "not only constitute the structure of cells, but they also are responsible for the various activities which we associate with the 'living process'." Heretofore proteins were produced only within living cells. Dr. Webster has been able to remove a protein-forming system from a living cell in an active form and to induce it to make protein in a test tube. Biochemists believe the work is likely to provide a key to the understanding of many life processes. It may advance cancer research efforts by providing fundamental knowledge of how cell proteins are formed — a basic problem in cancer study.

Research — Continued

sources such as the sun and the atom, an increased life span, better health with shorter periods of illness and reduced manual labor. Research also has brought better food with improved nutrition, more productive man-days with more leisure time, improved communications, an enriched aesthetic heritage, improved recreational opportunities, hope for cure and relief from illnesses formerly believed incurable, and faster, safer and more comfortable transportation.

It has been estimated that the United States is



SCHOLARLY WRITING — The writings of members of the Department of English faculty have for many years brought distinction to the University as a center in the midwest for scholarly achievements. Representative of the energetic productiveness of the English staff are the authors pictured on this page. They are but a few of many in this one department. All of Ohio State's more than 23,000 students are required to study English composition and literature — most of these in the undergraduate colleges, which represent by far the majority of the student body. Every teacher conducts undergraduate classes thus bringing the undergraduate student into direct personal contact with leading scholars and authors. For many students, the study of English is their introduction to the humanities as well as their training in the basic skills in expression.

PROFESSOR JOHN HAROLD WILSON — In the field of the English Restoration, Professor Wilson is internationally known as one of the world's great scholars. Here he holds his 11th book, **All the King's Ladies.** He is currently finishing another, **The Personality of Samuel Pepys.**

PROFESSOR RICHARD D. ALTICK — One of the most important books in the field of social history, **The English Common Reader,** by Professor Altick represents a study of the spread of literacy in 19th-century England. Professor Altick is one of six professors of English in this country to receive a coveted American Council of Learned Societies fellowship for 1959-60.

PROFESSOR RUTH HUGHEY — Her erudition in Elizabethan literature led Professor Hughey to discover in Arundel Castle, England, the **Arundel-Harington Manuscript of Tudor Poetry,** missing for 150 years. Her scholarly edition of this work will be published this year, her second book.

FROM LEFT — PROFESSORS CLAUDE MITCHELL SIMPSON, ROY HARVEY PEARCE, AND WILLIAM CHARVAT — "The energy of people like Charvat, Simpson, and Pearce seems to me almost incredible," said Dr. Robert M. Estrich, Chairman of the University's Department of English, in discussing the "productivity" of members of his staff. Professor Simpson has written and published about equally in the field of music and American literature with recent editions of Theodore Dreiser and of the music of Purcell and Mozart. Professor Pearce, author and editor, stirred major discussion with a recent critical essay, "Historicism Once More," published last year in the Kenyon Review. Professor Charvat, whose reputation in the field of American literature is international, is now completing the second volume of a study to be called **The Economics of Authorship in America,** the last of numerous publications, starting with **Origins of American Critical Thought** in 1936.

Research — Continued

spending about five billion dollars per year on "research and development," according to the National Science Foundation. A major portion of this expenditure goes into "development," rather than "research," reflecting the preoccupation of government and industry with immediate problems. This leaves the universities in the position of responsibility for basic research because almost no one else engages in it.

RESEARCH IS A $7 MILLION ENTERPRISE

Research at The Ohio State University, supported almost entirely through research contracts, and with some gifts and grants from non-state sources, is estimated as a seven-million-dollars-a-year enterprise. Were it not for these outside sources of support the burden would fall upon the state of Ohio. Actually, the Legislature has provided on occasion in the past only relatively small appropriations for a few specific research undertakings.

The lack of substantial allocations of state money to the University for research purposes has proved to be a penny-wise-pound-foolish error. Ohio State has lost millions of dollars yearly in outside grants

(Continued on page 38)

CORROSION — Corrosion represents an annual cost to industry of some $6 billion in the United States alone. Through fundamental research, metallurgical engineers at the University are constantly searching for a better understanding of the mechanism of corrosion and methods of prevention. Here Dr. Mars G. Fontana (left), noted authority in this field, checks a piece of apparatus that provides for the measurement and recording of electrode potentials and cell currents in metal. Assisting is Howard Pickering, Cleveland graduate student. Pickering obtained his bachelor's degree in Metallurgical Engineering at the University of Cincinnati.

SCHOOL-COMMUNITY SURVEYS — School districts in practically every county in Ohio have received assistance in planning their futures through surveys conducted by the University's Bureau of Educational Research and Service in the College of Education. This service has been extended recently to community planning, with the University's Division of City Planning in the School of Architecture cooperating. Illustrative of such community planning is this scene in Upper Arlington, Columbus suburb, with, left to right, C. C. Ryan, City Manager; Walter B. Heischman, Superintendent of Schools; and Dr. William R. Flesher, Professor in the University's Bureau of Educational Research and Service, who is the director of the Upper Arlington school-city study.

RESEARCH IN VISION — One current aspect of research pursued through the University's Institute for Research in Vision has to do with the very practical question of the relation of highway safety to billboards and traffic signs. This research is being carried out on a 25-to-one scale inside a 64-foot-long plywood tunnel at the University's Research Center on Kinnear Road. Jack H. Prince, Associate Professor in the Ophthalmology Department, holding a miniature billboard, here observes test driver Kathryn Heft pull to a stop in a wooden auto used in the experiments. Time required for a driver to divert his attention to read highway billboards and signs is being measured. In addition to basic studies of the anatomy and physiology of the eye, the Institute is also conducting studies of improved highway lighting for use in fog, of optimal levels of lighting for streets and highways, and of lighting requirements for various indoor tasks.

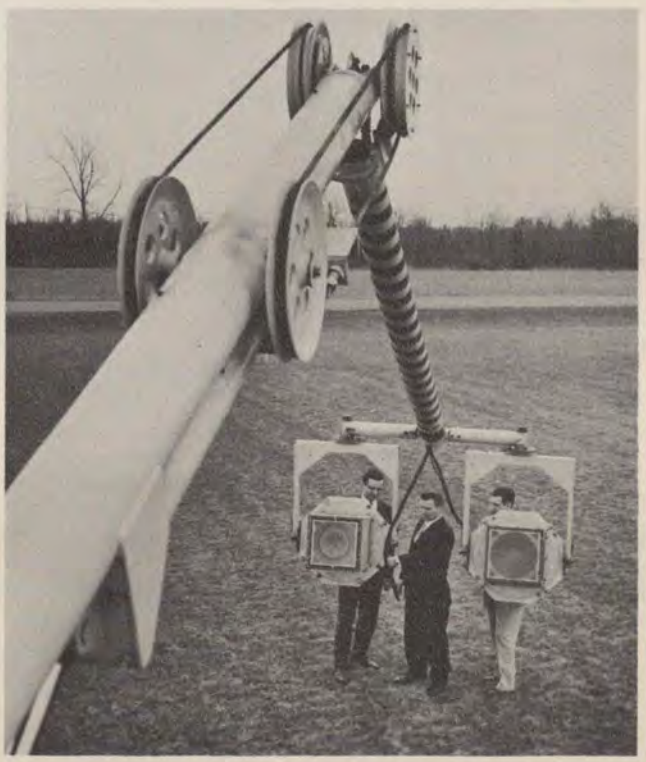
POLITICAL SCIENCE — The University is exceptional among American universities for the strength and scope of its program in political theory. Last year Professor David Spitz published **Democracy and the Challenge of Power** (Columbia University), a sequel to his **Patterns of Anti Democratic Thought** (Macmillan, 1949). Professor Harry V. Jaffa is shown here inspecting a color proof of the dust jacket of his forthcoming **Crisis of the House Divided,** recently published by Doubleday, which is the first full-length study of the famous Lincoln-Douglas debates. It is Professor Jaffa's second book, and the first in a two-part study of Lincoln's political philosophy. He is also editing currently, with Robert W. Johannsen, a volume of the speeches of Lincoln and Douglas in Ohio, to be published by the Ohio State University Press and the Ohio Historical Society.

CARBOHYDRATE CHEMISTRY — Over a period of almost three decades on this campus, Professor Melville L. Wolfrom and his associates have made notable contributions on the chemical nature of sugars and carbohydrates, including the chemical structure of the blood anti-coagulant heparin. Today the University is considered one of the leading centers of research in this field in the world. Professor Wolfrom's distinguished work brought election in 1950 to the National Academy of Sciences, the first of the only five living Ohioans to receive that distinction. So widespread is the interest of industry in this field that Professor Wolfrom's research is currently supported by the paper, cornstarch and soluble coffee industries. The Federal government has enlisted his help in preparing new compounds for testing against cancer. The U.S. Army has provided a grant for research in propellant materials. Through the annual publication by the Academic Press, Inc., New York City, of the book, **Advances in Carbohydrate Chemistry,** with which he has been associated since its first volume in 1945 and its editor since 1952, Professor Wolfrom is a key figure in the dissemination of information in this field internationally. With him here are, left, Dr. Walter von Bebenburg, postdoctoral fellow in organic chemistry from Hamburg, Germany, and, right, Bienvenido Juliano, graduate student from the Philippines.

STEREOCHEMISTRY — Professor Melvin S. Newman (center) holds membership in the National Academy of Sciences, the highest distinction that can come to an American scientist. His research into the effect of the size and shape of organic compounds on the chemical reactions they undergo has gained world-wide attention. Current studies may be of use in designing drugs for use in cancer research. Information previously developed is being applied to lubricants for engines which operate at high temperatures and to the improvement of drugs. A member of the chemistry faculty at Ohio State for 23 years, Professor Newman's fame in synthetic and theoretical organic chemistry is such that graduate and postdoctoral students come from abroad as well as from the U.S. to study under him. With him here are, left to right, Graduate Student Paul H. Goble (B.A. from Miami University) of Columbus; David J. Collins, a postdoctoral fellow in organic chemical research from Sidney, Australia; Graduate Students Arlen B. Mekler of New York City and Tada Fukunaga of Osaka, Japan; and Dieter Pawellek, a postdoctoral fellow, also in organic chemical research, from Munich, Germany.

Research

ANTENNAS AND RADAR — The Antenna Laboratory, started in 1941 by two graduate students working part time, has become the leading research center of its kind in the United States. Its field station alone now occupies a large specially designed building. The Laboratory employs a staff of 98 people and has expanded its research into such additional fields as astronautics, automatic controls, radomes, navigational and communication problems encountered in interplanetary travel and terrain investigations. Mobile equipment used to determine the basic radar reflectivity properties of various types of terrain is pictured here with, left to right, Dr. Thomas E. Tice, Director of the Laboratory; Robert C. Taylor, Eaton, O., graduate student, who built both of the microwave units shown; and Robert A. Fouty, Assistant Director.



ROCKET FUELS — One of the few university rocket research laboratories in the nation is located at The Ohio State University. The laboratory and a series of quonset huts which contain shops and office space are isolated for safety on the West Campus. Here under the supervision of Dr. Rudolph Edse (left), Director of the Laboratory, research is currently in progress on combustion instability in high-pressure flames, one of the causes of missile failures at Cape Canaveral. Dr. Edse holds a photograph taken of an explosion inside the combustion chamber, right, which enables measurements of burning velocities at 1,500 lbs. per square inch — higher than the pressures reached by any liquid propellant used in present rocket engines. With him is William A. Strauss, Ph.D. candidate from Cleveland.

LOW TEMPERATURE PHYSICS — In process of installation is this 45-ton electro-magnet in a special two-story unit provided in the Physics Building addition for the University's famous Low Temperature Physics Laboratory. When installation is completed sometime this Autumn, Dr. John G. Daunt, distinguished Oxford-educated head of the laboratory and his associates will be able to pursue basic research into the composition of matter at temperatures which may approach one-millionth of a degree of absolute zero. The huge, seven-foot magnet, designed by Dr. Daunt, will provide Ohio State with the nation's largest iron core electro-magnet for producing high magnetic fields for low temperature research.

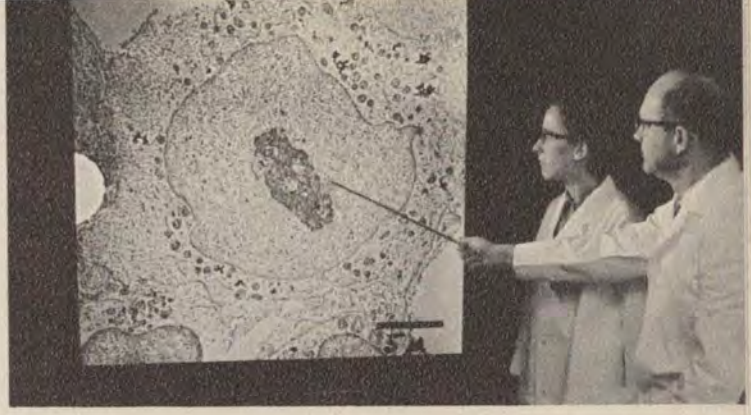
DELINQUENCY PREVENTION — What "insulates" a child against delinquency — especially in a high delinquency area? Dr. Walter C. Reckless (left), Ohio State's internationally known criminologist, believes he is on the verge of isolating the principal factor. In May he started a project which may confirm his preliminary conclusions. It involves 1,000 sixth graders in the high delinquency area of Brooklyn, N. Y. Age 12 years is the threshold for delinquency — the age at which youngsters get into "official" trouble. Here Dr. Reckless, with Doris Ferrel, Director of the Franklin County Juvenile Center, and Graduate Student Frank R. Scarpetti of Cleveland, employ the simple distractions provided by some Latin American musical instruments in reducing the fear and strangeness of an initial interview with three youngsters at the Center.

HISTORICAL WRITING — Author of **A History of Presidential Elections,** Professor Eugene H. Roseboom of the Department of History, in 1958 was awarded the Ohio Academy of History Certificate of Award for the "outstanding historical work" in the state. For the state's sesquicentennial in 1953 he and his departmental colleague, Professor Francis P. Weisenberger, co-authored **A History of Ohio,** now in its fourth printing. **A History of Presidential Elections,** published by Macmillan in 1957 and now in its second printing, was Professor Roseboom's fourth major work. He is currently writing a history of national political conventions.

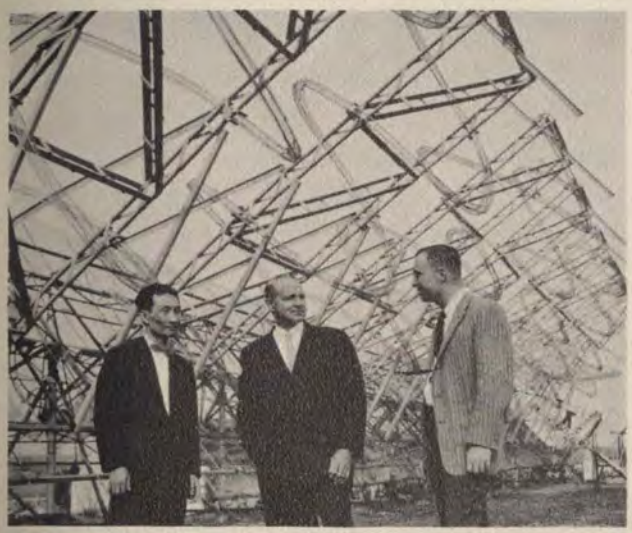
Research — Continued from page 35

and gifts because it has been unable to produce the "ante" money necessary to share fairly in $300 million a year from charitable foundations and $450 million a year from the Federal government.

One of the results of this situation has been that over the years numerous distinguished and productive members of the faculty have left the campus



MALIGNANT DISEASES — This is the malignant destroyer of man — a cancer cell, magnified 50,000 times by the electron microscope. This cell section, here examined by Dr. Walter J. Frajola, Director of the Herman A. Hoster Research Laboratory, and Marie Greider, graduate student from Newark, was taken from the lymph node of a patient suffering from Hodgkins disease. Work in this laboratory in the Health Center is devoted to basic research in the biochemistry of disease.



RADIOASTRONOMY — Even as man projects his machines farther and farther into space, the radioastronomer tracks them and goes on far ahead in the search for more knowledge about the outer universe including that area not penetrated by the optical telescope. Few universities operate radio observatories on as large a scale as that of The Ohio State University. Under the direction of Professor John D. Kraus (center) the University's Radio Observatory has made notable contributions to knowledge in this field, brought world-wide prestige to this state. Latest research, for which giant helical antennas have been mounted on the radio telescope shown here, centers on the planet Jupiter. This extremely cold and large (80,000 miles in diameter) planet is emitting radio impulses believed by some to be generated by intense electrical disturbances. Robert T. Nash (right), Instructor and graduate student in Electrical Engineering, designed the structure for the telescope; Dr. Hsien Ching Ko, Assistant Professor of Electrical Engineering, will be directly in charge of the research.

because funds were not available for the laboratory space and equipment they needed to pursue the research in which they were informed and interested.

A recent tabulation of grants from the National Institutes of Health shows Ohio State as eighth among the Big Ten schools, with 42 grants (in 1957) of $500,000. In a listing of grants from charitable foundations, Ohio State also ranked eighth among the Big Ten schools, and had received only four grants totaling $40,000. In comparison the University of Minnesota received 135 NIH grants amounting to $2,070,000 and the University of Michigan obtained 23 grants totaling $9,500,000 from charitable foundations. Clearly Ohio State is far behind her sister institutions in securing research grants.

What funds the University does have for its widespread and aggressive research program come from various sources, which might be grouped as follows:

1. The Ohio State University Development Fund (through gifts by alumni and friends), Grants-in-Aid and Assigned Research Duty allocations.

2. Outside grants, principally from the National Science Foundation and National Institutes of Health.

3. Contract research for governmental agencies

PHILOSOPHY — Professor Morris Weitz of the Department of Philosophy is the author of **Problems in Aesthetics,** published this year by The Macmillan Company; is working on his third book, **Hamlet: A Study in the Philosophy of Criticism.** He will spend most of his time next year in England at Oxford on a Guggenheim Fellowship, granted to enable him to finish this work. His study will embrace the major criticisms written on Hamlet, the magnitude of which is considerable. More has been written by critics about this famous Shakespearean play than any other work of art in the history of the world.

and private industry, handled through the Ohio State University Research Foundation.

As this Report was being completed there were hopeful signs that a new day of recognition for Ohio State's research program by the Governor and Legislature was at hand. Included in the appropriations request enacted by the General Assembly was an item of $688,000 in support of research on the campus as recommended by the Governor.

Someone has said that to have a great state there must be a great university. All agree that the key to the future growth and progress of America lies in research. Ohio State, with its program of high-level research in nearly every major area of human development, is making a unique contribution for this state toward the wealth, well-being and cultural development of Ohio and the nation.

GLACIOLOGY — Some 20,000 years ago when the last major invasion of ice (5,000 feet thick) from the north left deposits in 66 of the 88 counties of Ohio, this piece of tree was buried under the earth and debris carried by the glacier. It was found just a few years ago in Butler County, 60 feet below the surface. Here examining this specimen is Dr. Richard P. Goldthwait (right) of the Department of Geology, who is perhaps as well informed about glaciers of Ohio and the rest of the world, past and present, as any living man. With him is Floyd R. Nave, Ph.D. candidate in geology from Springfield, O., an instructor at Wittenberg University.

VOICE COMMUNICATION — The benefits of research in voice communication extend from the home telephone to the control towers of the airports which link Ohio to the rest of the world. Improvement in intelligibility is a prime objective in voice communication research. Here in these two scenes are the typical components of an experiment in the University's Speech and Hearing Clinic (1) a panel of listeners (left) who indicate what they hear when a recorded speech signal is played back to them, and (2) the control panel at which various aspects of the physical stimulus are recorded, and, in this scene (right), are being examined, left to right, by Graduate Student Al Nichols of Cleveland Heights, and Professor John W. Black, Director of the Speech and Hearing Science Area in the Department of Speech.

ORGANIZATION BEHAVIOR AND LEADERSHIP — Research in leadership, through the Personnel Research Board, twice in 1958 brought national recognition to the University for significant contributions to improving human relations and productivity in working organizations. Representative of the interdisciplinary approach used by the Board in the study of organizational behavior is this research seminar. Members of the seminar are, left to right, two sociologists (Gisela J. Hinkle and J. Eugene Haas), a psychologist (Carroll L. Shartle, Chairman, Personnel Research Board), and an anthropologist (John W. Bennett), here inspecting a model representative of a phase of the problems. Objective of the research immediately at hand: understanding and predicting behavior in organizational structures.

Leadership in Educational Television

THE OHIO STATE UNIVERSITY, long recognized for its leadership in educational broadcasting, continued during the year of this Report its unique contributions among the state's educational institutions in this field. Significant progress was made particularly in the exploration of the broadcasting media as devices fundamental to the teaching process on all levels of instruction.

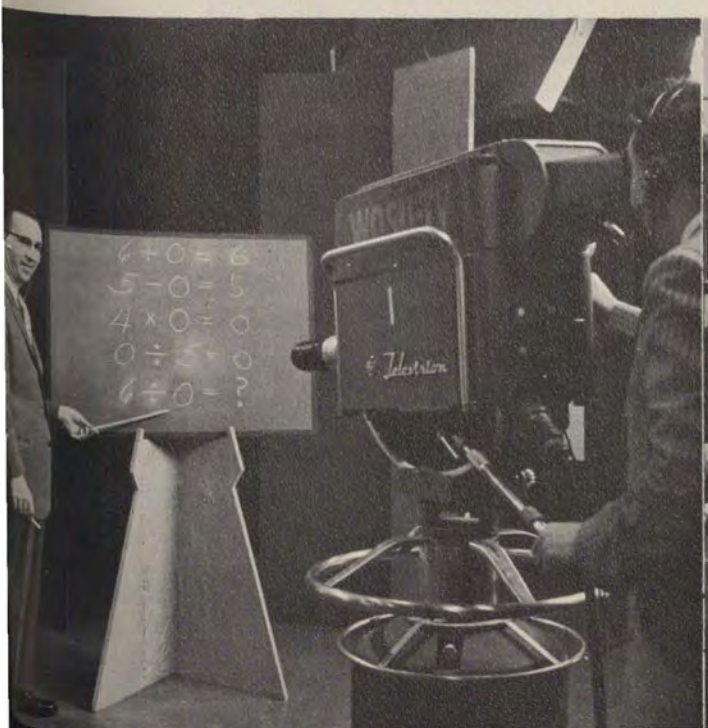
The University looked to television to broaden its teaching potential on and beyond the confines of the campus to such distant points in the state as the Marion and Newark branch centers, and later, the Mansfield branch. The effectiveness of television to achieve this objective was demonstrated in an experiment this year in the teaching of mathematics.

This experiment, in its second phase, involved 1,000 students on the Columbus campus and in the two Ohio State branches at Marion and Newark. It was found that grade achievements equaled those of students taught conventionally. Top students liked television, those at the "C" level were indifferent, and the "D" and "E" students deplored it.

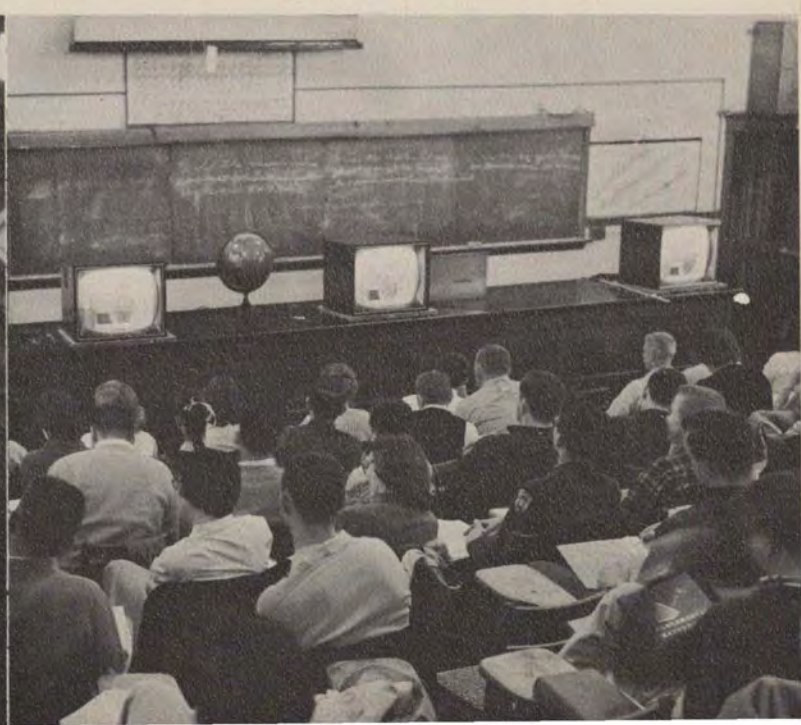
The third phase of the experiment will begin in the Fall Quarter. Students at the Mansfield branch center of the University will be involved along with those in Columbus and the other two branches. Joint sponsorship of this project will come from the Fund for the Advancement of Education, the University, the Columbus Public Schools and the State Department of Education.

Course offerings via television will be increased

DR. LESLIE H. MILLER, Director of Mathematics 400 course, lectures before television camera in studios of the University's TV station on West Campus.



STUDENTS WATCH televised lecture in Math 400 course in one of classrooms on Main Campus. Instructors in each room handle questions and quizzes after the telecasts.



MOBILE CONTROL ROOM for the University's television station is housed in this bus, which also is used to transport mobile cameras to various parts of the campus for remote telecasts. The bus itself was donated to the University by the Lake Shore Bus System.

in this third phase. Mathematics 400 and Health Education 400 will be taught to University freshmen in Columbus and the three out-of-town branches. Junior high school students in Columbus Public Schools will receive televised lessons in Health Science. Senior high students will be taught 10th grade English.

The State Department of Education, as part of the same experiment, will supervise televised instruction, via WOSU-TV, in chemistry for rural high schools in Franklin, Licking and Union counties. At least 2,000 students will be involved in the experimental groups.

Demonstration studies completed during the year just past have illustrated again the effectiveness of educational television among adult groups. Systematic instruction for supervisory development was presented over WOSU-TV to classes meeting in four different industrial plants in Columbus. An entire course in physiology for high school teachers was presented by University faculty members to teachers who viewed in their own schools within a 45-mile radius of the University's TV studio.

Recognizing the potential of television in the state's impending enrollment crisis, the University's Telecommunications Services is continually exploring ways to make this medium an effective and accepted help in this situation.

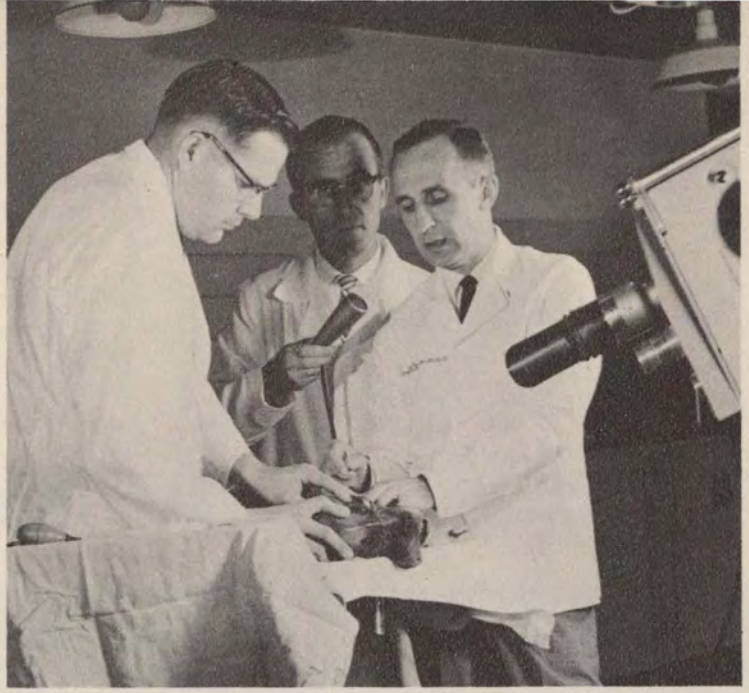
Working with the Ohio Council on Educational Television this unit of the University developed plans for a statewide educational television network and submitted them to the Ohio Commission on Education Beyond the High School. The proposed network, involving both state supported and private colleges in Ohio, would provide a design for systematic supplementation of junior college curricula throughout the state and would serve also secondary and elementary schools.

One of the more unusual projects of the University's Telecommunications Services involves the legal profession. An experimental system is being designed for the transmission of materials from the library of the College of Law on the campus to remote reception points in county bar libraries and even attorneys' offices. Working with the University on this project have been several electronic companies.

Although broadcasting functions of the University come within the budgeted operating expenses of the University, the University Committee on Telecommunications and its sub-committee on Research in the New Media, have had to look elsewhere for research support. In this they have been modestly successful obtaining some $260,000 for telecommunications research and study.

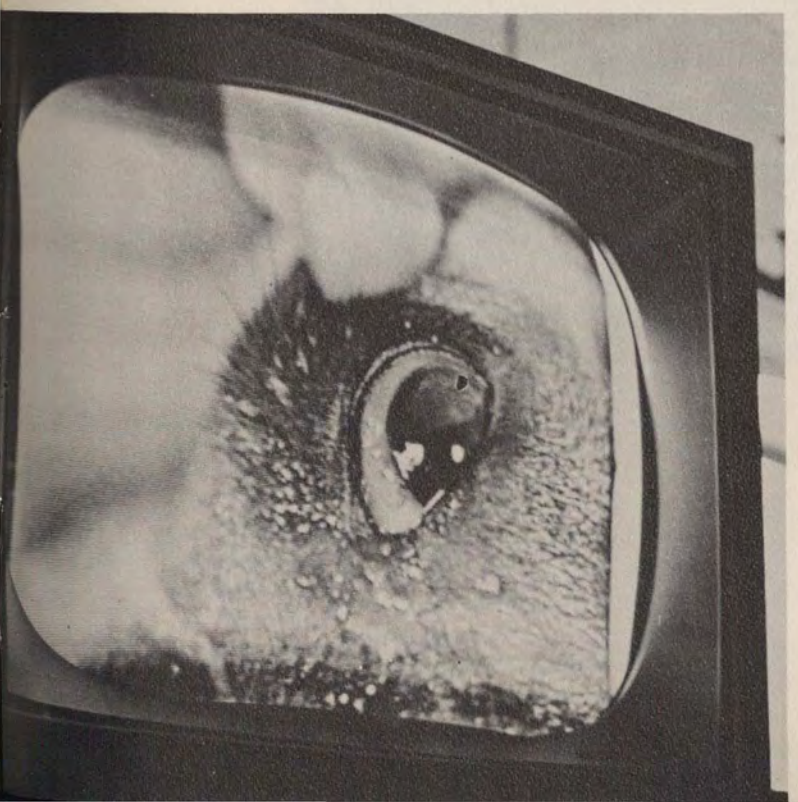
Sources for these funds have included The Fund for the Advancement of Education, the U. S. Office of Education, and the Battelle Memorial Institute, with matching contributions from the State Department of Education, the Columbus Public Schools, the University Office of Instruction and Research, the University's Bureau of Educational Research and Service and some project funds provided directly by WOSU-AM-FM-TV.

As veterinary doctors treat dog's injured eye in surgery room,



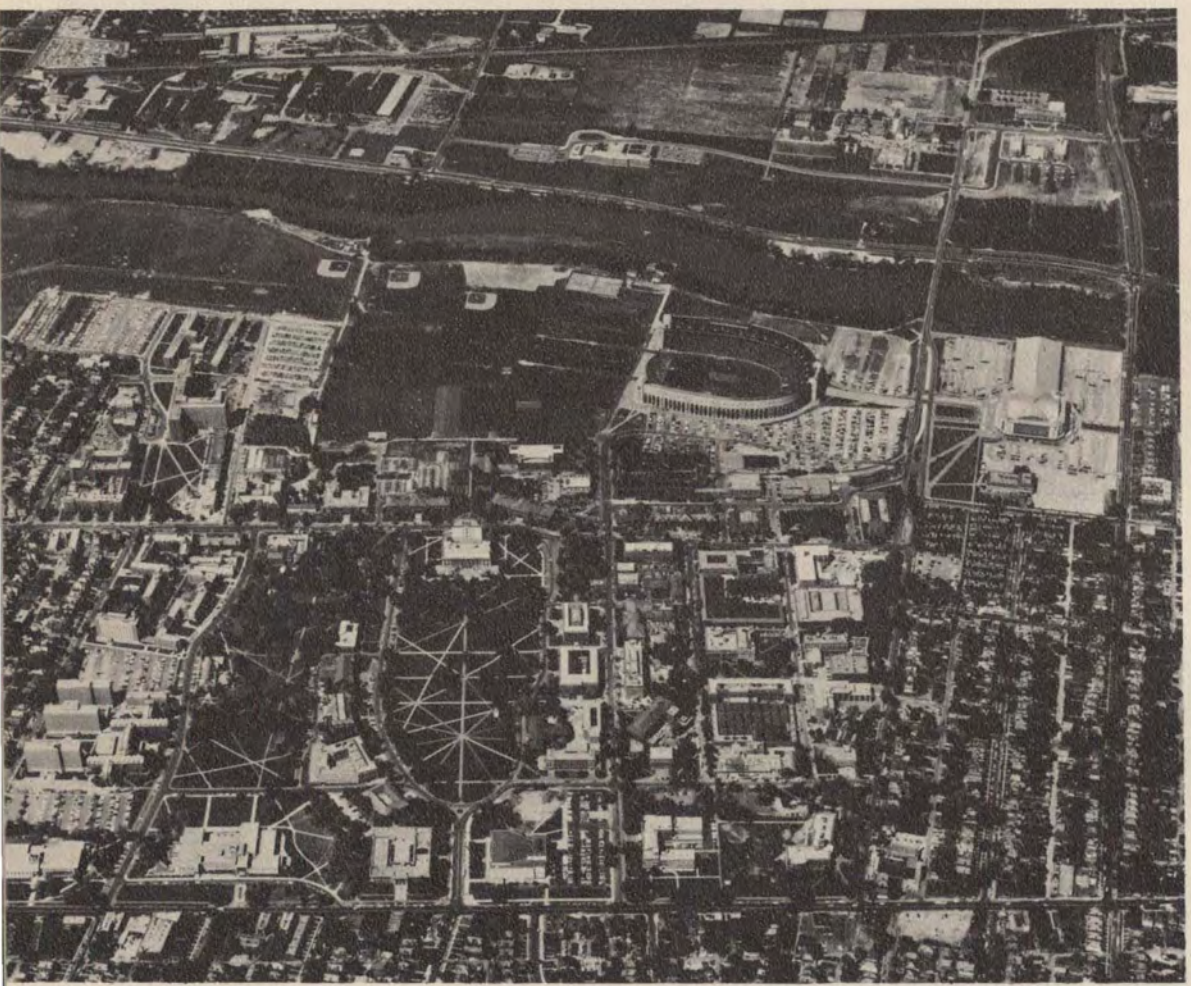
Left to right, Veterinary Doctors William J. Roenigk, David O. Jones and E. F. Donovan

Veterinarians and others attending the annual Conference for Veterinarians, June 16-17, 1959, on the occasion of the dedication of Sisson Hall, witnessed this demonstration of closed circuit television as a teaching tool. Technicians of the University's Telecommunication Services handled the details, with the remarkable results illustrated in this picture of the injured eye of the dog patient. An audience of 200 watched on television screens in the new auditorium while veterinary doctors in a surgery room in another part of the building treated injured and ailing animals.



audience elsewhere in the building has this close-up view on the television screen.

The Main Campus 1959



"The University . . . will continue to grow until there are no more diseases to be conquered, no more soils to be enriched, no more lessons to be learned from the past, no more secrets of nature to be discerned, no more qualities of the human spirit to be converted into individual and civic action."

From "The Mission of the University" by Professor Coleman Griffith, University of Illinois

The Ohio State University